

Optimize your costs with DB2

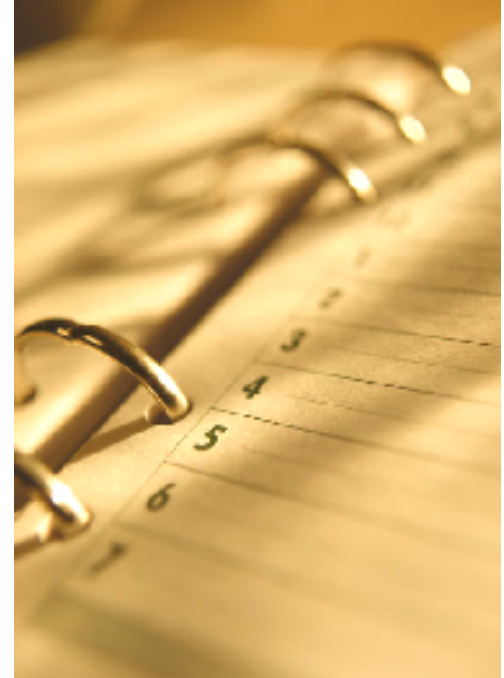
ISICC - IBM SAP International Competence Center, Walldorf
Gürsad Küçük – Client Technical Specialist Leader, Europe



19th January 2012, Istanbul

Agenda

- *TCO Aspects and Business-Case Calculation*
- *Performance*
- *Reference*



DB2 Advantages for SAP Applications & Cost Optimizations

Strategic Partnership with SAP and DB2

- **SAP involved in the DB2 development**
- Roadmap synchronized → line items until 2015
- **Over 1000 DB2 systems at SAP**
- In 4-8 weeks available with SAP
- **At least „7+2“ years supported with SAP**
- Reduced requirement for database upgrades/patches
- **Less tuning required (SAP knob)**

Reducing the Overall Costs (TCO)

- Reduced DB storage size 30%-70%
- Reduced NLS online data 50%-80%
- **Reduced tape capacity 80%**
- Reduced DB-RAM 20%-50%
- **Reduced log space 50%**
- Reduced temporary space 50%
- **Better OLTP performance 20%**
- Better OLAP performance 50%
- **RTO < 1min and RPO = 0**
- Less license+maint. with SAP OEM 47%

**ROI often in
1-2 years**

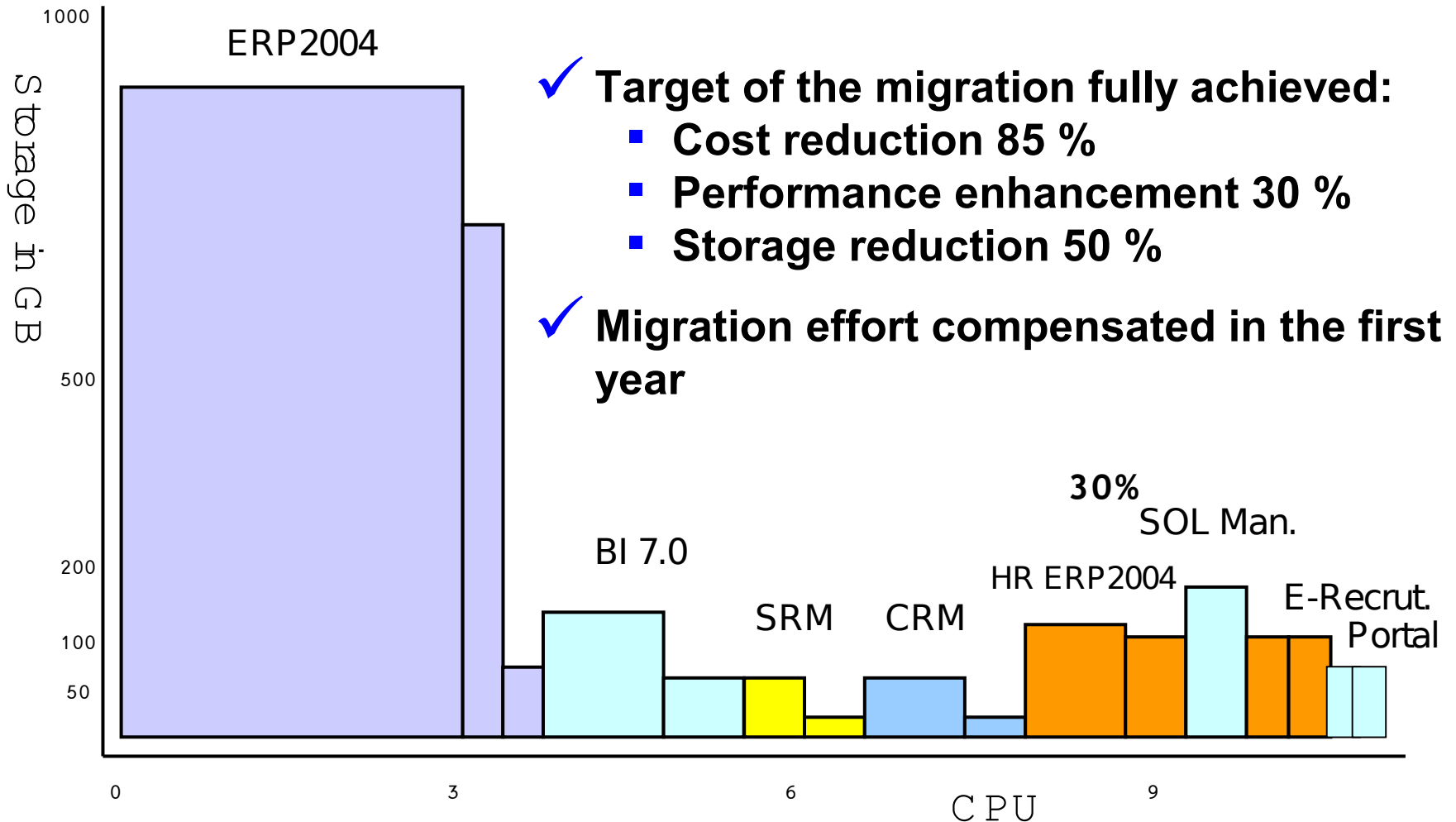
Innovative Database Technology

- **Leading DB2 performance**
- Integrated high-availability and disaster-recovery – easy, efficient
- **State-of-the-art database administration – automated, integrated**
- Adjusted development with SAP
- **NLS (near-line storage) integration into DBACOCKPIT**
- SAP BW optimization with DPF/MDC
- **HP-UX Itanium support for the next DB2 version**
- VMWare, XEN and Hyper-V fully supported

Migration Customer Examples

- **AUDI:** DB2 9.7 on AIX and IBM DS8K storage. Better performance, up to 74% storage saving
- **Eli Lilly:** DB2 9.5 on Redhat-Linux, VMware and EMC storage. Better performance, over 62% storage saving (during unicode conversion)
- **K+S AG:** DB2 9.1 on Suse-Linux, VMware and NetApp storage. 28%. Better performance, 40% storage saving (during unicode conversion)
- **Knorr-Bremse:** DB2 9.5 on HP-UX, HP-XP and NetApp storage. Better performance, 55% storage saving
- Coca-Cola, Nestle, Pepsi, Samsung, SAP, ...

ThyssenKrupp-Rasselstein



SAP on DB2 Development

Development of SAP code

Development of DB2 code for
SAP-specific line items

SAP Development support

Cooperation with DB2 Service

Jointly staffed by IBM and SAP

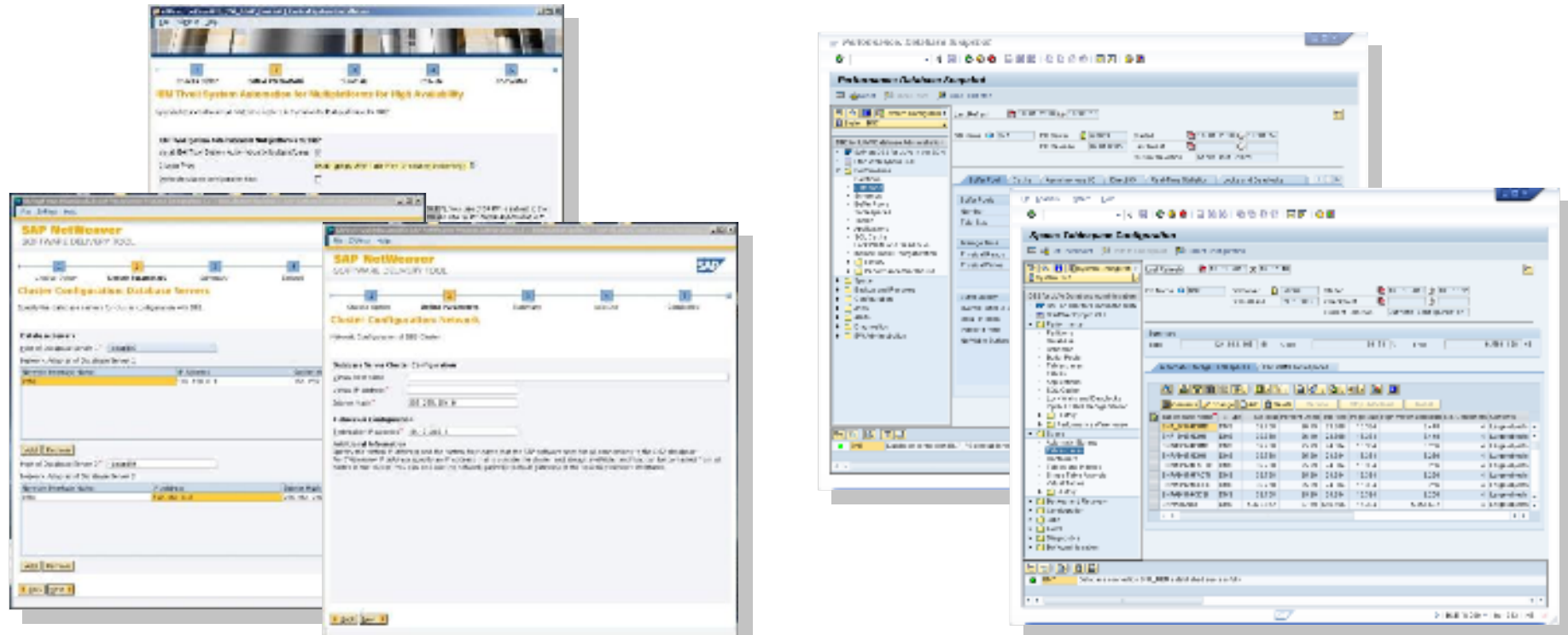
SAP on DB2 Integration Center

- Integration of new DB2 code with existing GA level SAP releases
- DB2 QA for every new DB2 code level with SAP applications far before IBM GA
- SAP Development support
- Cooperation with DB2 Service
- Jointly staffed by IBM and SAP

SAP on DB2 is a fully integrated product



- Integrated installation of DB2 software during SAP install *
- Integrated HA setup during SAP install *
- One-step SAP-tailored DB2 configuration: DB2_WORKLOAD=SAP
- Full DB2 administration and monitoring through SAP DBA Cockpit



Technology Innovation Roadmap Deliverables



- Four releases of DB2 Optimized for SAP
- Measurable value for SAP customers through direct TCO reduction
- Optimal stability through very early testing and verification far before IBM GA
- Near-concurrent GA by SAP: Certification within 6-8 weeks after IBM GA
- Early customer adoption

DB2 Version 9.1

Released by SAP since **August 2006**

Production use by customers since **September 2006**

DB2 Version 9.7

Released by SAP since **August 2009**

Production use by customers since **December 2009**

2005

2006

2007

2008

2009

2010

DB2 Version 8.2.2

First DB2 "Optimized for SAP"
Released for SAP since **June 2005**

DB2 Version 9.5

Released by SAP since **December 2007**
Production use by customers since **February 2008**

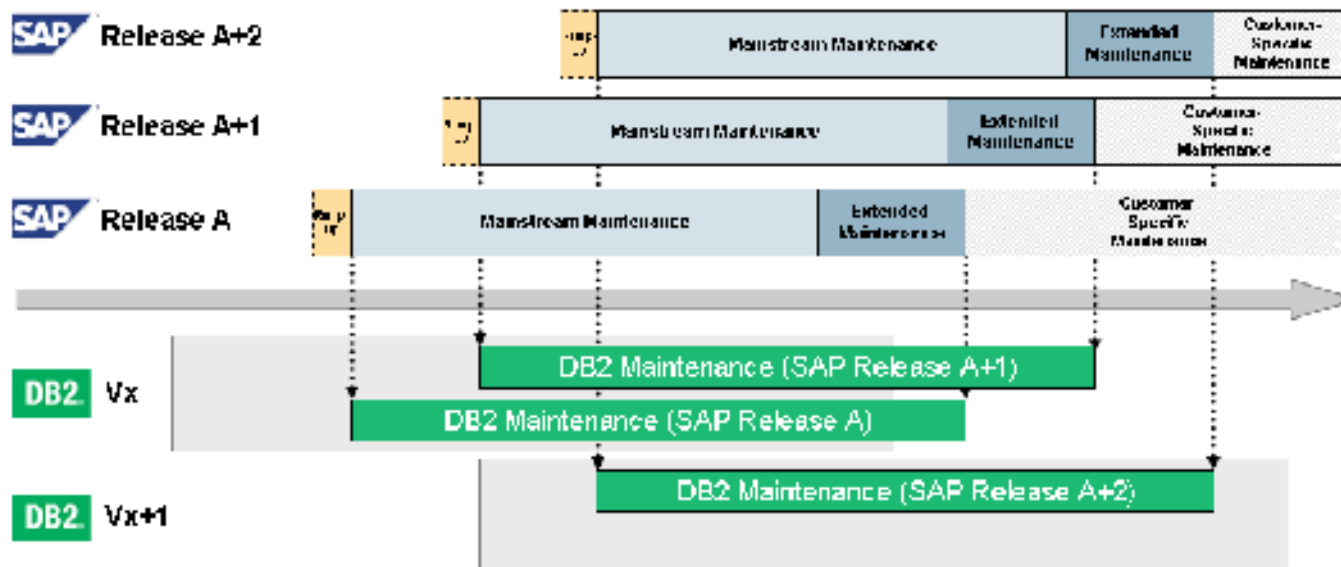
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DB2 follows SAP's maintenance strategy



- Your DB2 release remains in service for the complete 7+2 and 5+1+2 maintenance of your SAP application (see [SAP note 1168456](#) and [IBM TechNote 1051638](#)) *
- As a result you have the **freedom of choice**
 - You can stay on your current DB2 version if you desire
 - You can upgrade to the next DB2 version on your current SAP release to benefit from the technology innovations provided by IBM and SAP
- Unmatched business value: **No forced or undesired database upgrades**



* Applies to customers who have purchased DB2 from SAP. Customers with other DB2 entitlement need to obtain a DB2 Service Extension from IBM

DB2-SAP: Strategic Technology Alignment and Support

Database version	Database GA	SAP DB GA	Delay between database and SAP GA (in months)	SAP DB support until
DB2 8.2	29.04.2005	03.06.2005	1	31.12.2015*
DB2 9.1	28.07.2006	31.08.2006	1	31.12.2017*
DB2 9.5	31.10.2008	20.12.2008	2	31.12.2017*
DB2 9.7	26.06.2009	28.08.2009	2	31.12.2022*
Oracle 9i	June 2001	Q1/2003	21	31.07.2008
Oracle 10g	January 2004	Q3/2006	31	31.07.2011
Oracle 11g	July 2007	Q2/2010	33	January 2015

* DB2 follows SAP's maintenance strategy 7+2,

Status: 2nd November 2011

Source: SAP Marketplace (PAM), SAP hint 1174136

Joint development and early tests during the implementation in Toronto IBM/SAP

Integration Center and Walldorf Development during the Alpha&Beta stage

- ➔ DB2 between 1-2 months delay supported by SAP
- ➔ DB2 supports existing versions much longer (DB2 8.2 support ends after Oracle 11.2g de-support)

Relaxed long-term project planning combined with usage of most current technology

- ➔ Use so long as you like the older DB2 versions
- ➔ Go as fast as you need to newer DB2 versions

Database Patch Comparison for Current Versions

Database	# Patches	# Months
DB2 8	18	106
DB2 9.1	10	63
DB2 9.5	8	46
DB2 9.7	4	26
Oracle 10.2g	213	61
Oracle 11.2g	112	19

Status: 2nd November 2011

Source: SAP hint 101809, 1137346

SAP Marketplace → Downloads → Database Patches

Oracle Critical Patch Update - January 2012

The Oracle Critical Patch Update for January 2012 was released on January 17th, 2012. Oracle strongly recommends applying the patches as soon as possible. Please note that Sun products are included in the Critical Patch Update.

The next four Critical Patch Update release dates are:

- April 17, 2012
- July 17, 2012
- October 16, 2012
- January 15, 2013

Critical Patch Update - September 2011

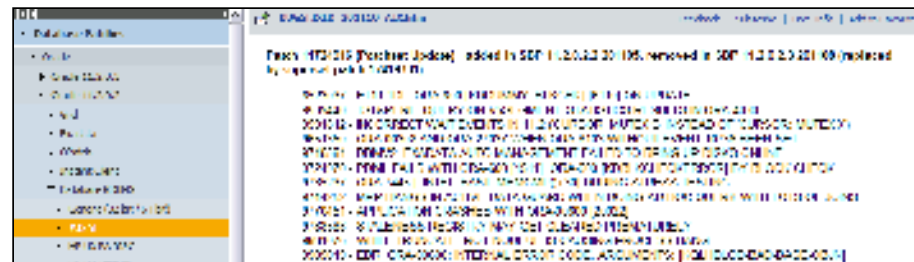
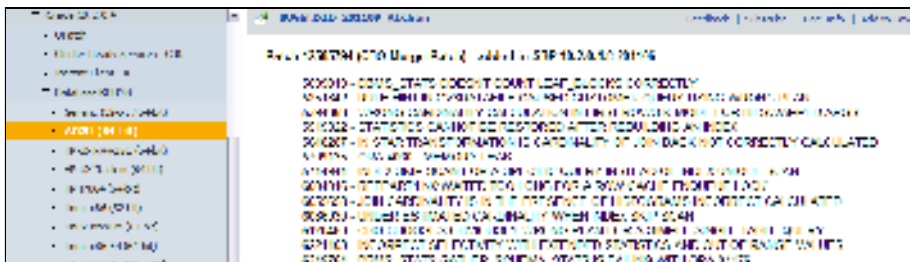
Oracle Security Alert for CVE-2011-3192 was released on September 15th, 2011.

Oracle strongly recommends applying Security Alert [CVE-2011-3192](#) as soon as possible.

- SAP supports only for DB2 four versions (DB2 9.8 additionally available under pilot program)
- SAP's '7+2' maintenance strategy fully supported by DB2
- DB2 9.1, 9.5 und 9.7 - average 1 patch per 6 months
- Oracle 10.2g - average 3 patches per 1 months
- Oracle 11.2g - average 6 patches per 1 months
- Oracle databases must be patched at least with the critical patches, which are provided 4 times per year (usually January, April, July and October)
- **Oracle 11.2g patches for 19 months is more than the patches for all DB2 versions together**
- **DB2 provides much more reliable and stable operating**

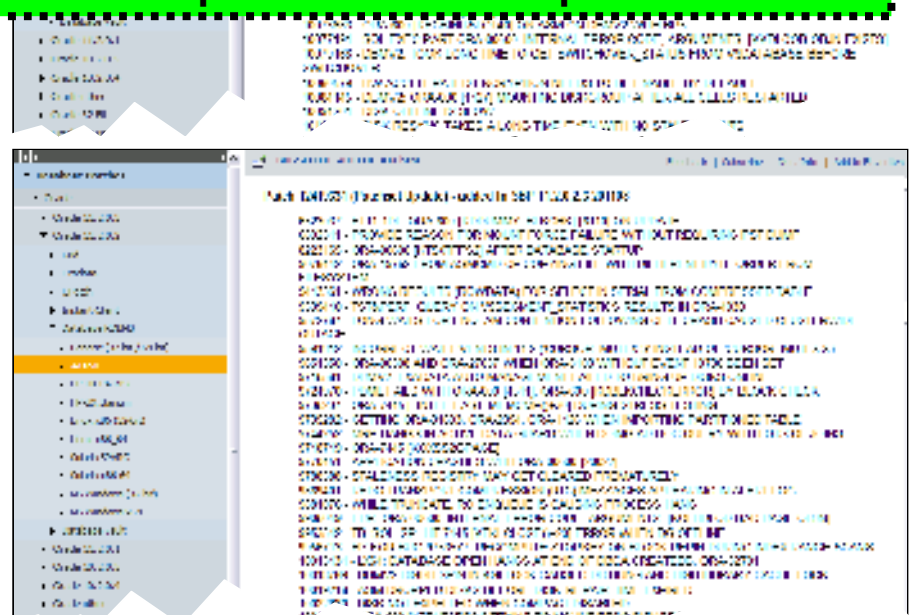
Oracle Patches and the included Sub-Patches and Bug-Fixes

1. Oracle 10.2g patch 12585794 contains 106 sub-patches / bug-fixes
2. Oracle 10.2g patch 9352164 contains 412 sub-patches / bug-fixes
3. Oracle 11.2g patch 11724916 contains 67 sub-patches / bug-fixes
4. Oracle 11.2g patch 12419331 contains 126 sub-patches / bug-fixes



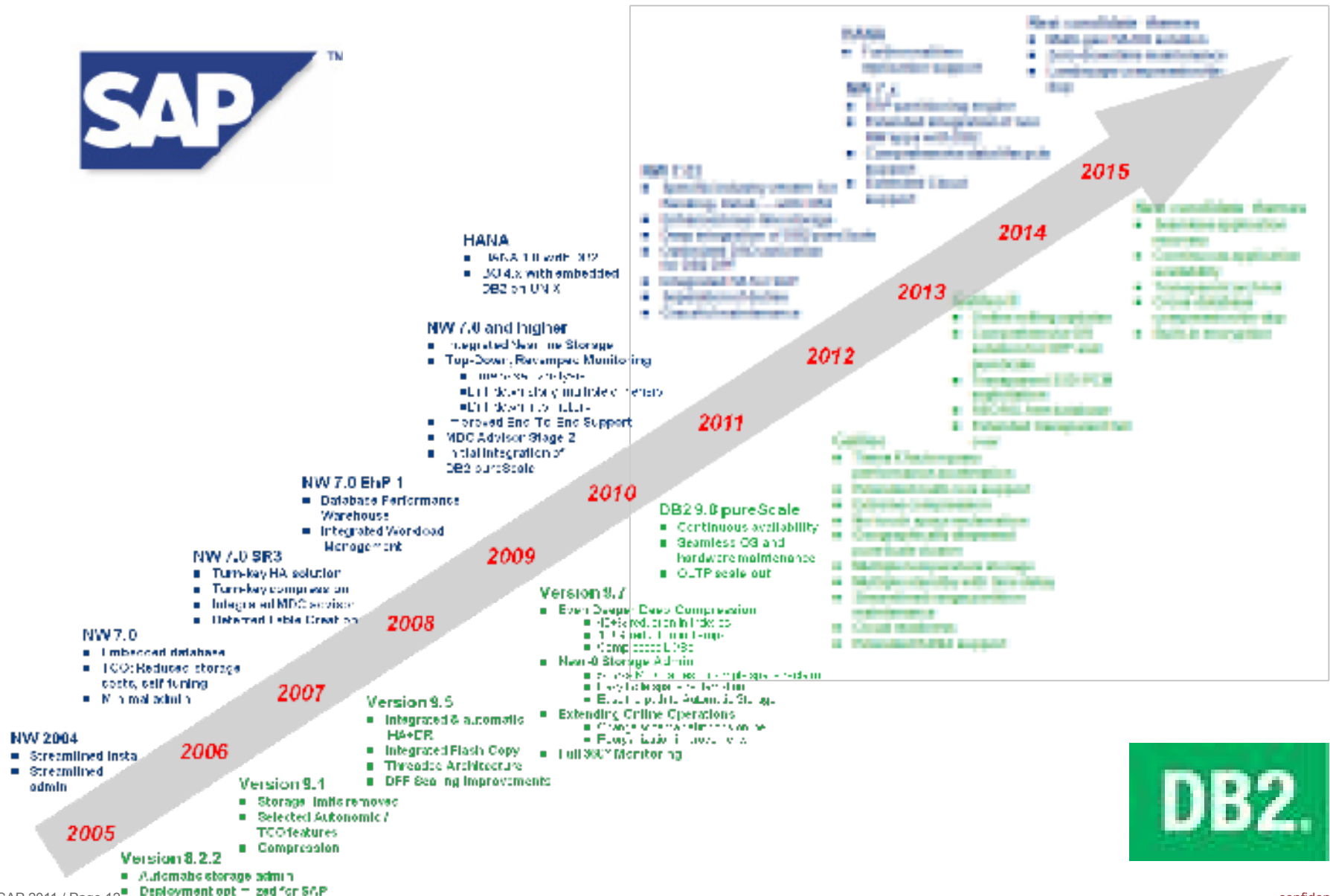
!!! DB2 9.7 has in 4 patches altogether 25 bug-fixes !!!

One Oracle 11.2g patch has much more bug-fixes/sub-patches than complete DB2 9.7



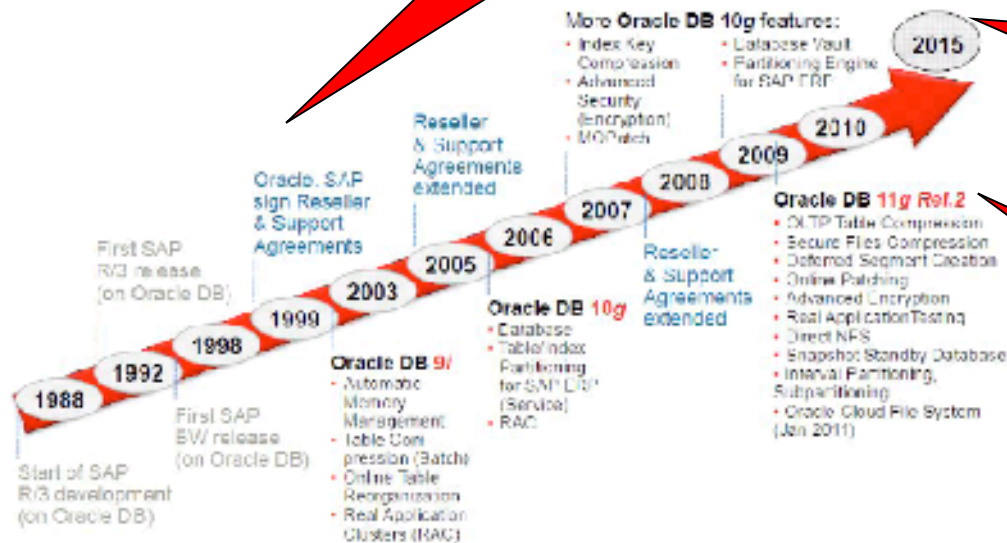
Status: 2nd November 2011, from SAP Marketplace

DB2 Optimized for SAP – Roadmap



DB2.

Oracle's View of Roadmap with SAP



DB2 is synchronized with SAP's development. Here only some old Oracle items are mentioned

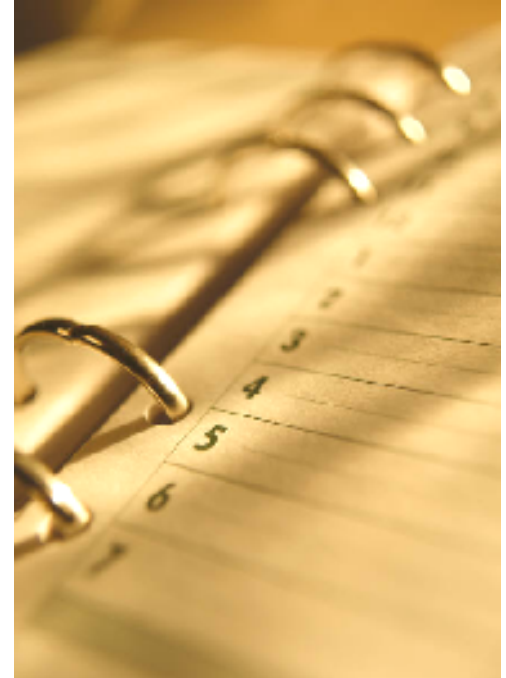
Only the roadmap until 2010 without real SAP focus

Only by writing 2015 is not a roadmap. Where are the milestones and items ?

Oracle 11g is existing since 2007. This is a view 4 years **back to the history**. **Where is the view to the future ?**

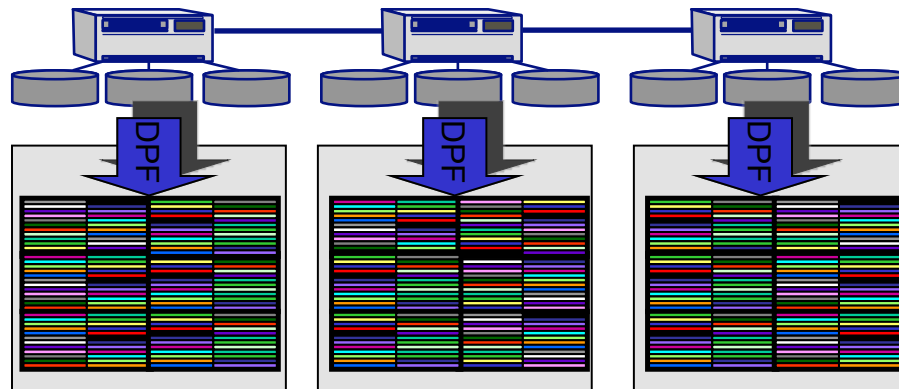
Agenda

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- **Performance**
- *Reference*

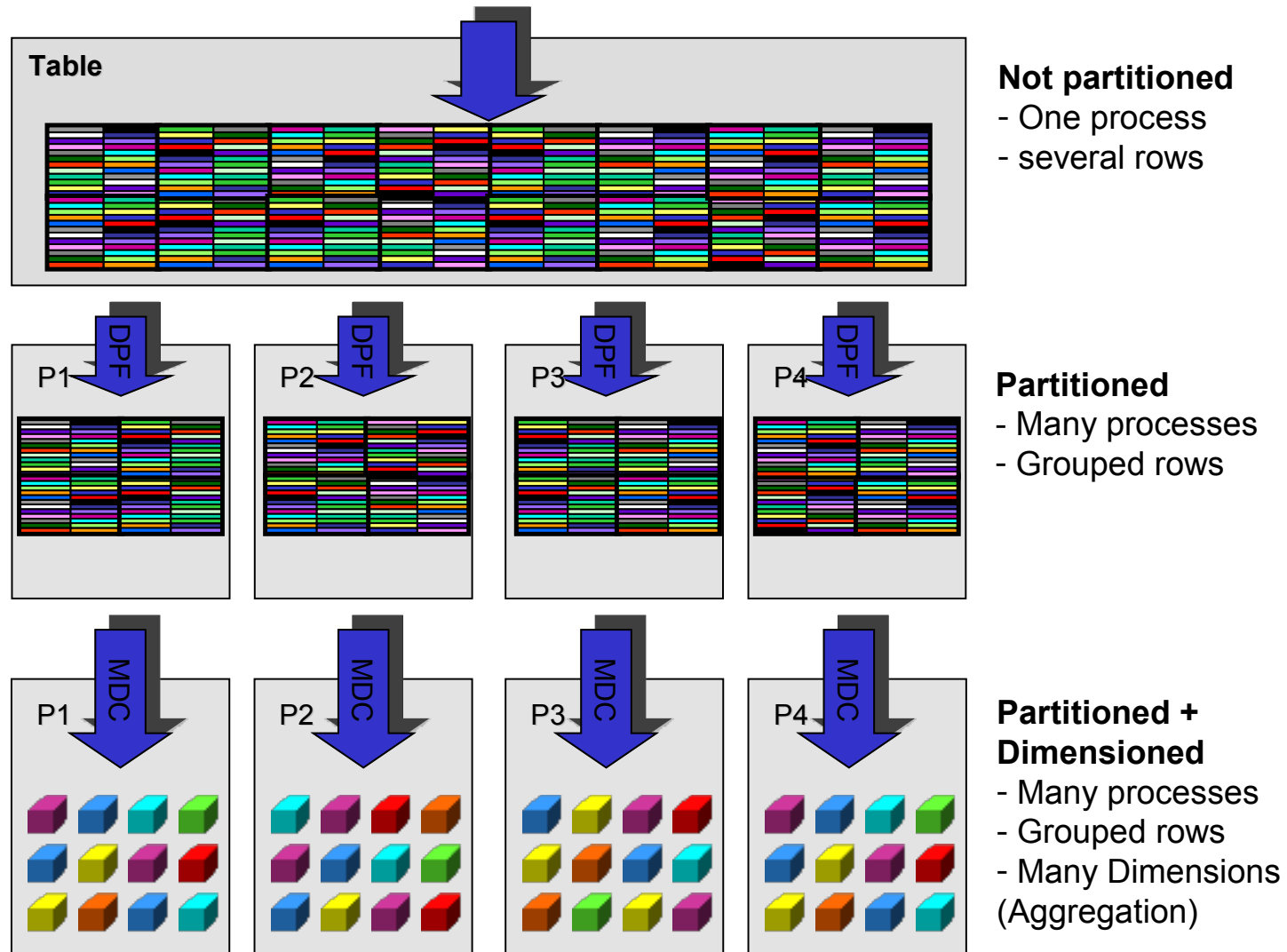


SAP BW – With DB2 DPF smaller and cheaper server

- SAP BW exploits existing database functions for best performance behaviour
- SAP supports for Oracle die Range-Partitioning (slow, hard to implement, hard to maintain)
- SAP supports for DB2 DPF/Range-Partitioning and MDC dimensional clustering
 - Administration fully automated by DB2
 - **DB2 DPF runs on several distributed servers**



SAP BW – Optimale Performance mit DPF/MDC



SAP BW – ANDing DB2 MDC Blocks

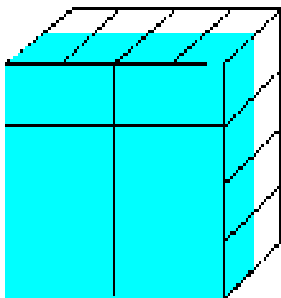
- ANDing over several block areas

```
SELECT * FROM MDCTABLE  
WHERE COLOR='Blue'  
AND NATION='Turkey'
```

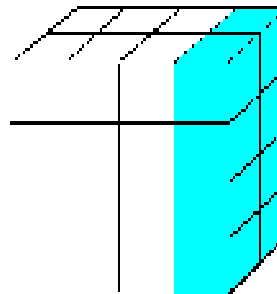
Blue	4,0	12,0	48,0	52,0	76,0	100,0	216,0
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Turkey	12,0	76,0	92,0	100,0	112,0	216,0	276,0
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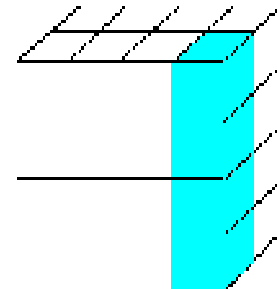
12,0	76,0	100,0	216,0
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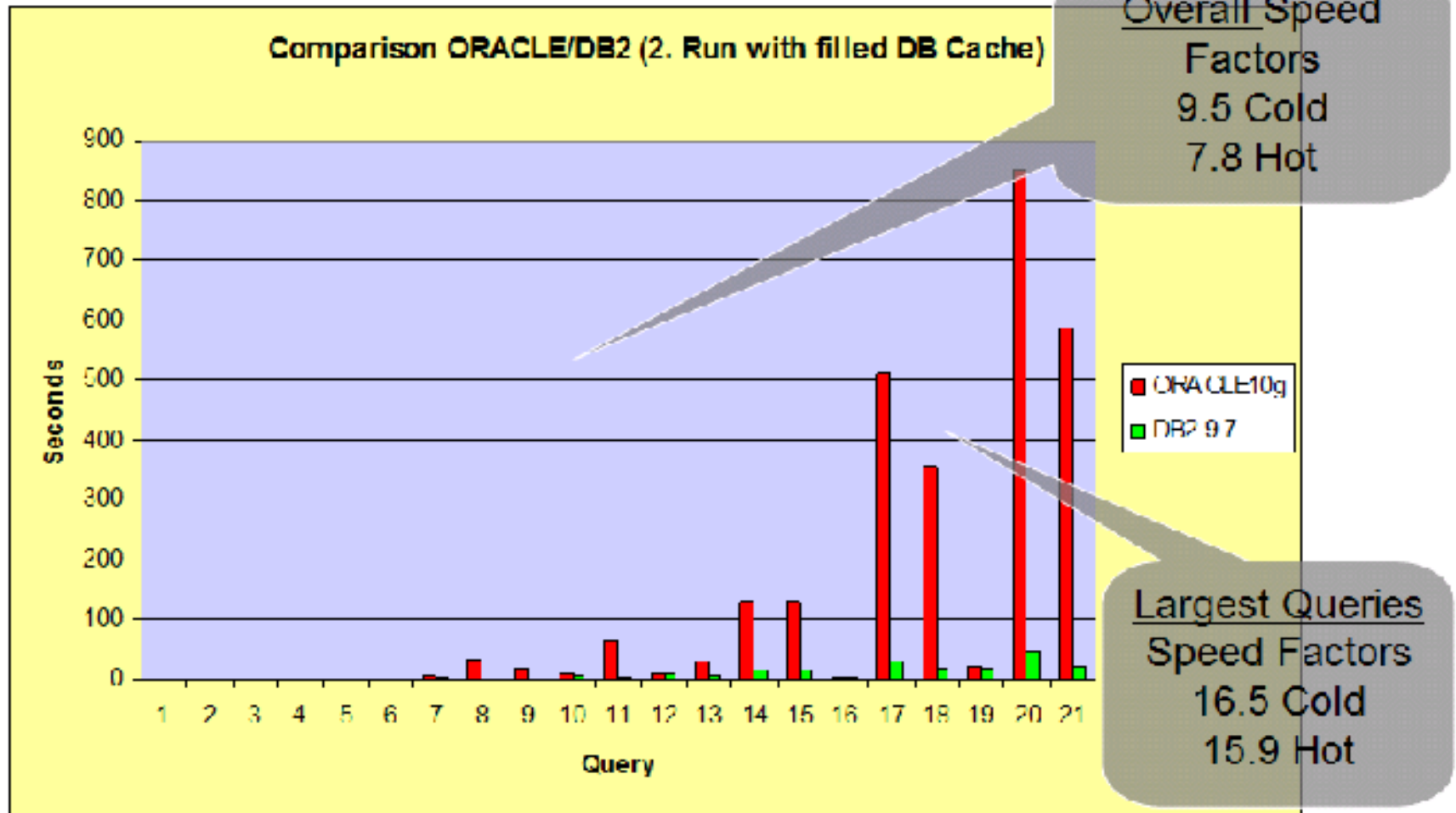
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SAP BW Case Query Test Results



Optimizing usage of Hardware and Delivering Better Performance

only DPF used, MDC not used

QueryTestcase	ORACLE			DB2			
	Start Time	OLAP Time	DB Time	Start Time	OLAP Time	DB Time	
1st Execution	20:10	55,7	865,5	12:35	56,8	37,2	→ DB time 23,3 x faster
2nd Execution	20:28	56,1	511,1	12:44	56,6	33,1	→ DB time 15,4 x faster

ETL Testcase	Oracle		DB2		
	Sum of Job Runtimes	Elapsed Time	Sum of Job Runtimes	Elapsed Time	
STEP 1	3790	1629	3630	1253	→ DB time 1,3 x faster
STEP 2	29437	22967	8689	7358	→ DB time 3,1 x faster

DB2 delivers on same HW much better performance for query and ETL jobs

- by using MDC additionally better performance up to factor 10

Near-Line Storage and SAP NetWeaver BW

Near-Line Storage (NLS) = „Near OnLine“ Storage as new archiving method works alone or in conjunction with SAP ADK (Archiving Development Kit)













- NLS data are separated from the online data (active data)
- Online read access to NLS archived data (passive data, read-only data)
- **Approx. 80% of the database content is passive data**

New data category

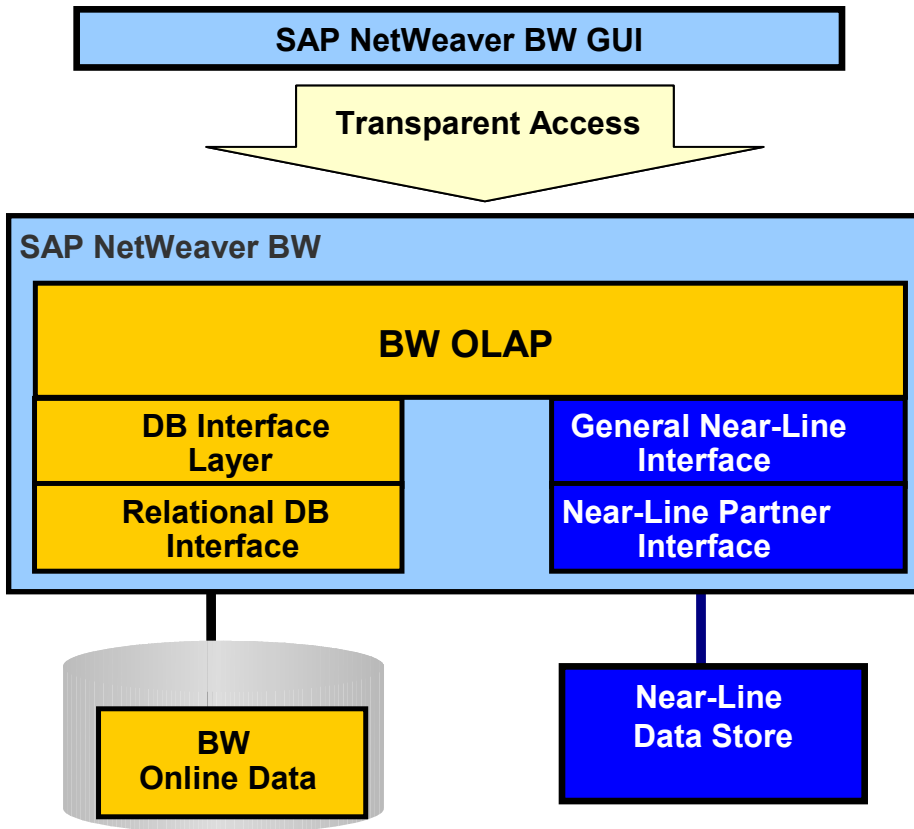
- Layer between online data (database) and offline data (archived data)
- Aged and infrequently accessed data

Performance requirements

- Acceptable slower query access to the NLS data
- High availability requirements are not so strong
- NLS data may be stored on less expensive hardware

		Online Database	Near-Line Storage = “Near Online” Storage	Classic Archive
Data location:  optimal  tolerable  unacceptable	Frequently read/changed data (actual)			
	Infrequently read data			
	Very rarely read data (aged)			

SAP NetWeaver BW Solution Architecture – Basics

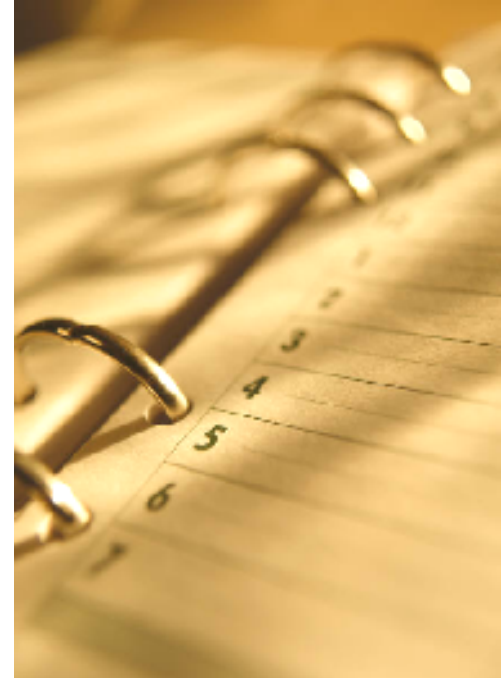


- **Separate SAP BW Online Data from Near-Line Storage (NLS) data**
- **Near-Line Storage Interface**
 - DAP (Data Archiving Process) Design
 - One NLS object per BW object
 - Specify data archiving criteria
 - DAP Call / Monitoring
 - Request based data transfer
 - Specify data which should be transferred to NLS
 - Automation of data transfer with SAP BW process chains
 - DAP run time
 - Transfer data into NLS
 - NLS data can be transferred back to BW online database
 - Transparent NLS data access
 - BW Queries
 - Data Transfer Process (DTP)

Enhancement Package 1 SAP NetWeaver BW 7.01 SP 6

Agenda

- *TCO Aspects and Business-Case Calculation*
- *Performance*
- ***Reference***



SAP Customers with DB2 on Linux, Unix and Windows

Hundreds of Global Companies Turn to IBM to Tackle Their Most Complex Information-Related Challenges

700 SAP Clients turn to DB2 over past 12 months

IBM press release, 26.10.2010 - <http://www-03.ibm.com/press/us/en/pressrelease/32867.wss>



Vorsprung durch Technik

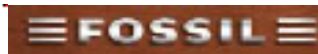
Audi



MAHLE

Driven by performance

KNORR-BREMSE



The Coca-Cola Company



Peek & Cloppenburg

JAB



SONY
make.believe



ZÜRICH

ERGON.E

NISSAN DIESEL

ROLF BENZ



Colgate World of Care



SCHAEFFLER GROUP

KARSTADT

TOYOTA

Pick n Play



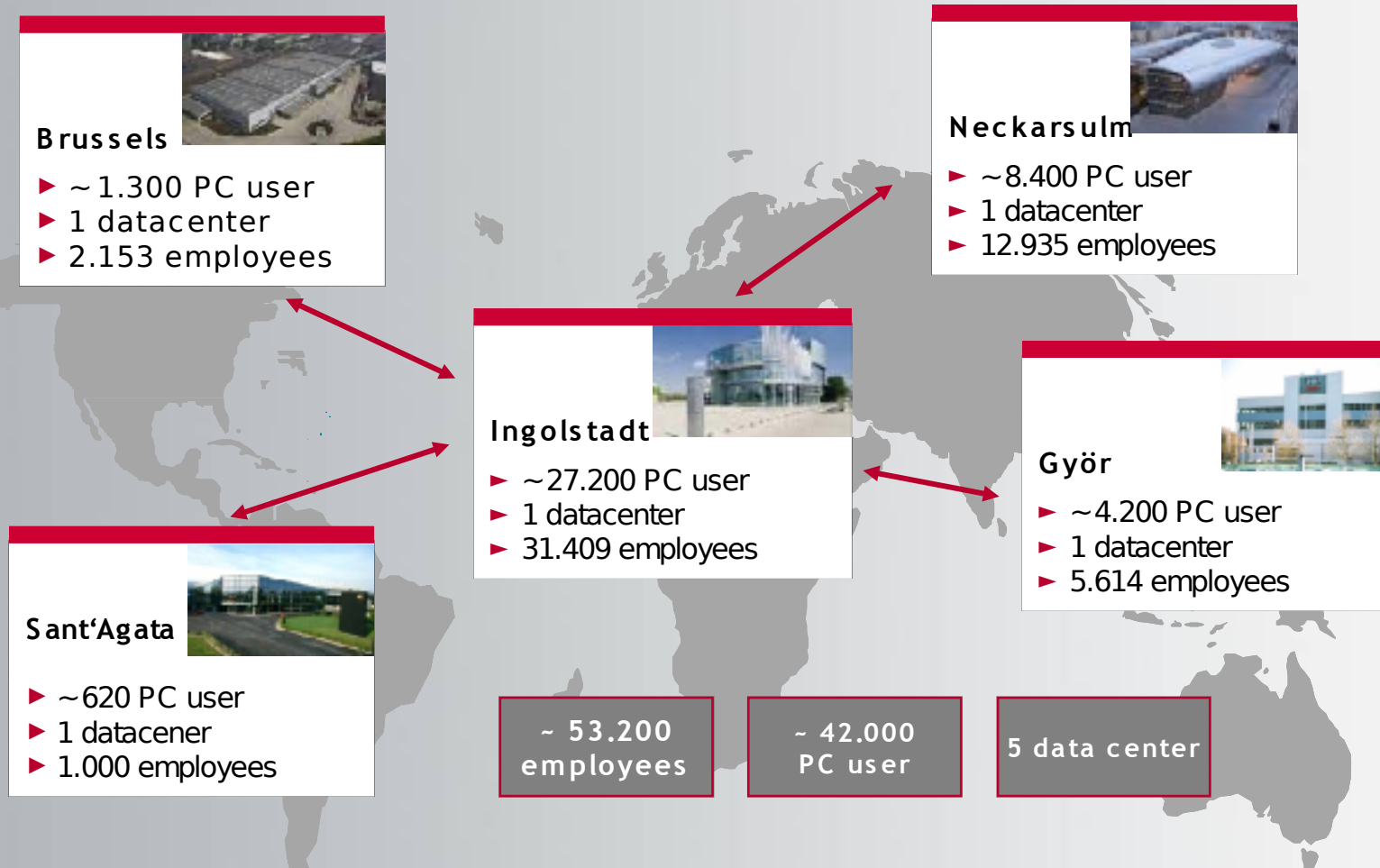
rku.it.



Manager



Audi IT



(source:: GB 2009)

Final Status „Next Generation SAP“

- ✓ 6 month migration schedule was 100 % met
- ✓ 1 step migration from Oracle to DB2
 - ✓ 2-5 migrations per week
- ✓ No unplanned interruption of service.
- ✓ Old hardware could be removed according plan YE 2010 (HP leasing end)



Until end of 2010 over 100 systems had been migrated

- ▶ 48 AUDI AG (Germany): 30 SAP landscapes
- ▶ 13 AHM (Hungary): 26 HA cluster implemented
- ▶ 31 Seat (Spain): 8 different networks
- ▶ 6 NSC (international)



- ▶ **Quality**
Application of CMMI and review of CMMI conformity
- ▶ **Budget**
Migration budget and running platform cost met expectation
- ▶ **Resources**
Internal and external capacities are available according to plan

Capability Maturity Model Integration is a process improvement approach

Server layout for the future: enabling the cloud

compact and environment saving technology

Database & SAP Central Instance

IBM POWER Server

- 4 x p570 (32 core Power6)
- 80 cores activated
- 36 cores ,on demand'

Application Server - 2 Bladecenter

- 14 x Power 702 Blades
- 16 cores Power7, 256 GB

Step I

- ca. 5,1 TB RAM activated
- ca. 0,5 TB RAM ,on Demand'
- scalability 676.000 - 761.000 SAPS BS7

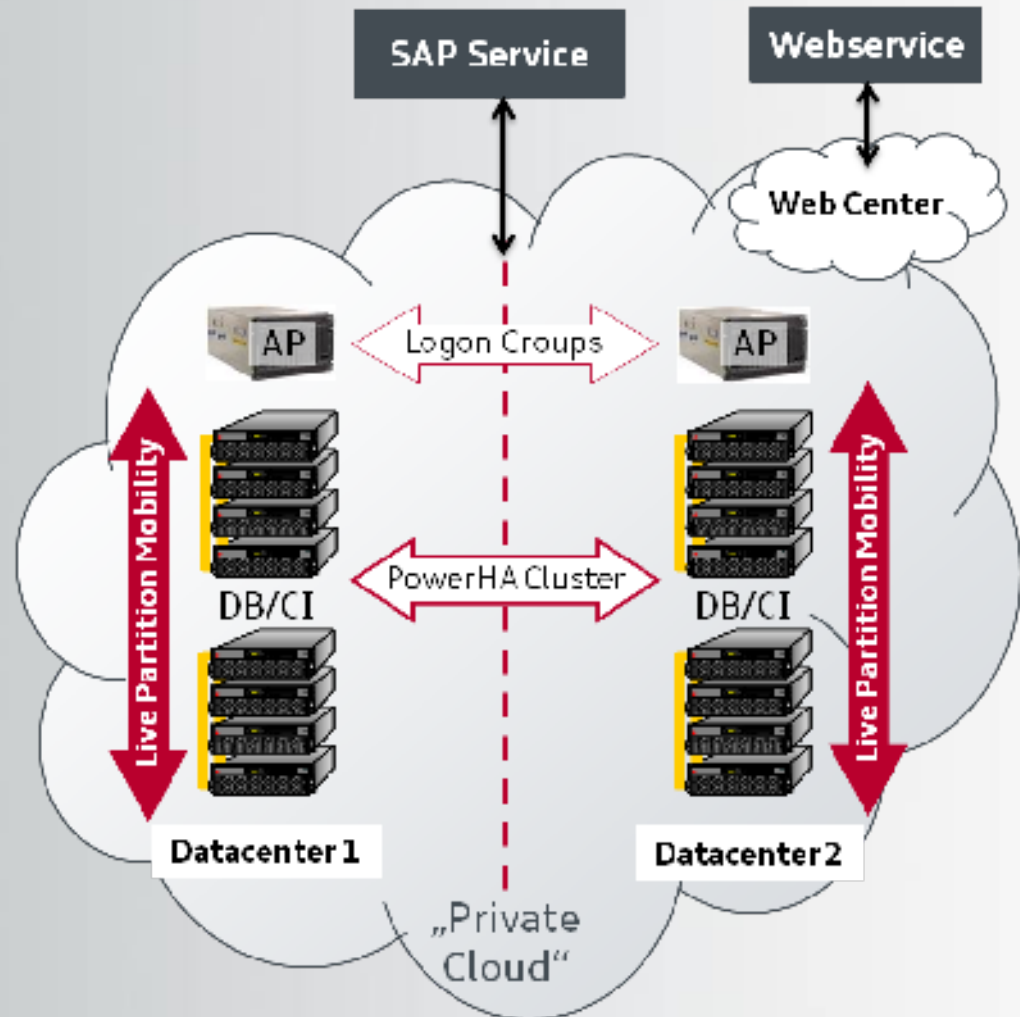
technology upgrade

Step II

DB server technology upgrade POWER 7

- 4 x Power 770
- 6,6 TB RAM installed
- 1,5 TB RAM ,on Demand'
- 785.000 SAPS

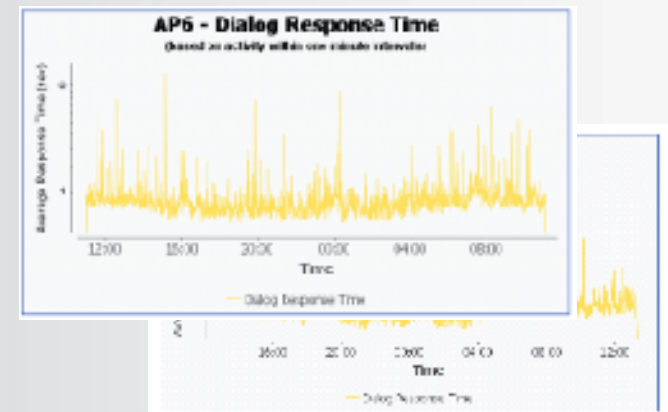
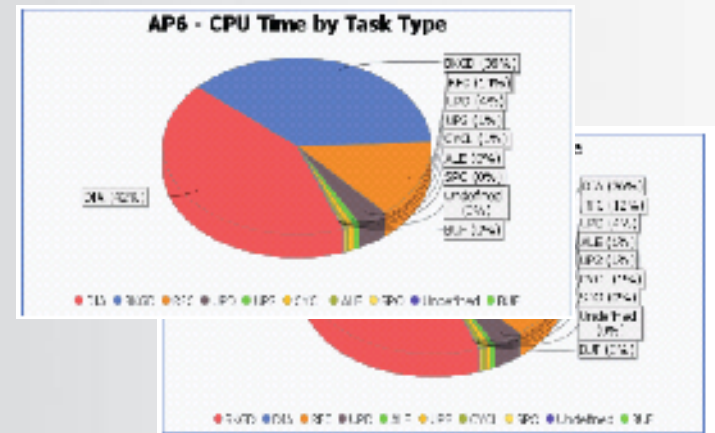
Total cloud upgradeability (no
additional server): ~ 1.135.800



Migration comparison data from the Audi SAP Cloud

Comparison: System AP6 „AHM logistics and production“

- **Database size**
 - 3,6 TB before migration (Oracle)
 - 1,5 TB after Migration (on DB2 9.7)
 - Backup time reduction from 10h to 2h
- **Dialog response times***
 - Improvement of transaction times
 - Top transactions ~40%
 - Average ~27%
- **Batch processing**
 - Runtimes half on average
- **Memory requirement of the SAP database***
 - ~45% less DB-RAM
 - 91% less RAM-SWAP



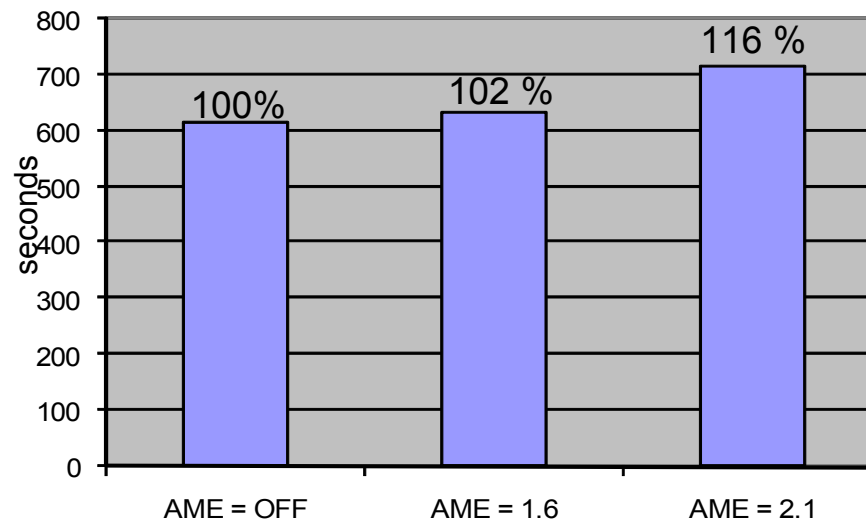
* First results in October 2010 without DB2 optimization and without AIX RAM compression

AIX AME Memory Compression and DB2 Compression Together

- DB2 9.7
- SAP BW 7.3
- 6,4 TB compressed

	AME = OFF	AME = 1.6	AME=2.1
Physical Memory (GByte)	64	40	30
Expanded Memory (GByte)	64	64	64
Average User CPU (%)	57.6	60.8	56.3
Average Sys CPU (%)	4.1	7.1	11.3
Average I/O wait (%)	2	2.6	2.9
Average disk R/W (MByte)	115	112	113.5
Run time (seconds)	615	630	714

DSO Activation - Run Time



Thank
You