

# Success Story about the Implementation of PBS CBW NLS IQ in the Power Supply

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Gert Prüser  
IT and Process Consultant  
Business Intelligence

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# Agenda

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1. Introduction of the swb AG
2. Initial Situation / Motivation for the Use of Nearline Storage
3. Nearline Storage - Essential Criteria / Implementation
4. Nearline Storage - Experiences
5. Conclusion – Outlook – Questions

# Introduction of the swb AG

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In the cities **Bremen** and **Bremerhaven** and the **Region of Northern Germany**, swb\* stands for many things that are fundamental for our customers on a daily basis:

- **Electricity**
- **Natural gas**
- **Drinking water**
- **and heat**

In addition, we provide diverse **technical services** and take care of the **energetic recycling of waste**.

Furthermore, our sister company EWE TEL offers **telecommunication services** in our sales area under the brand swb.

\*Turnover 2012 (in Mio. €): 1.195,9

\*Employees 2012: 2.448

# Initial Situation and Motivation for the Use of Nearline Storage (NLS)

# Initial Situation: Productive SAP BW Applications

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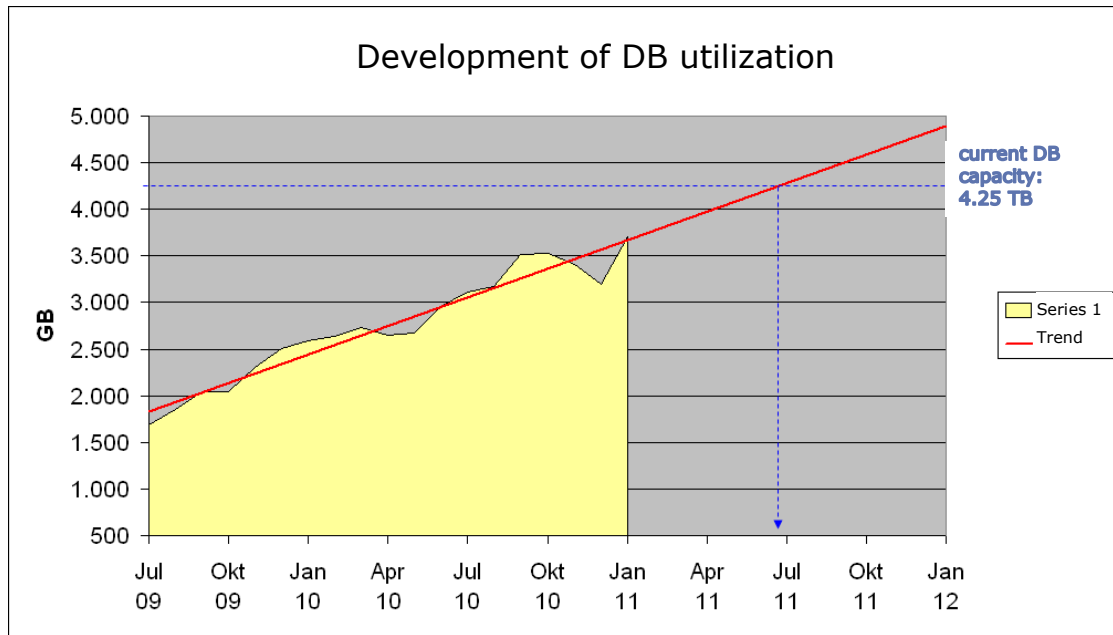
swb AG uses **SAP Business Warehouse** (SAP BW) as **central reporting system**. *(January 2007 implementation SAP BW Rel. 7.0)*

- Finances/Controlling
  - Cost centers
  - Legal reporting
  - Orders
  - Investments
  - Maintenance
  - Management information system
- Sales
  - Stock statistics
  - Sales statistics
  - Projection
- Materials management
  - Stock controlling
  - Procurement monitoring
- Receivables management
  - Open items
  - Incoming payment

# Initial Situation: Data volumes

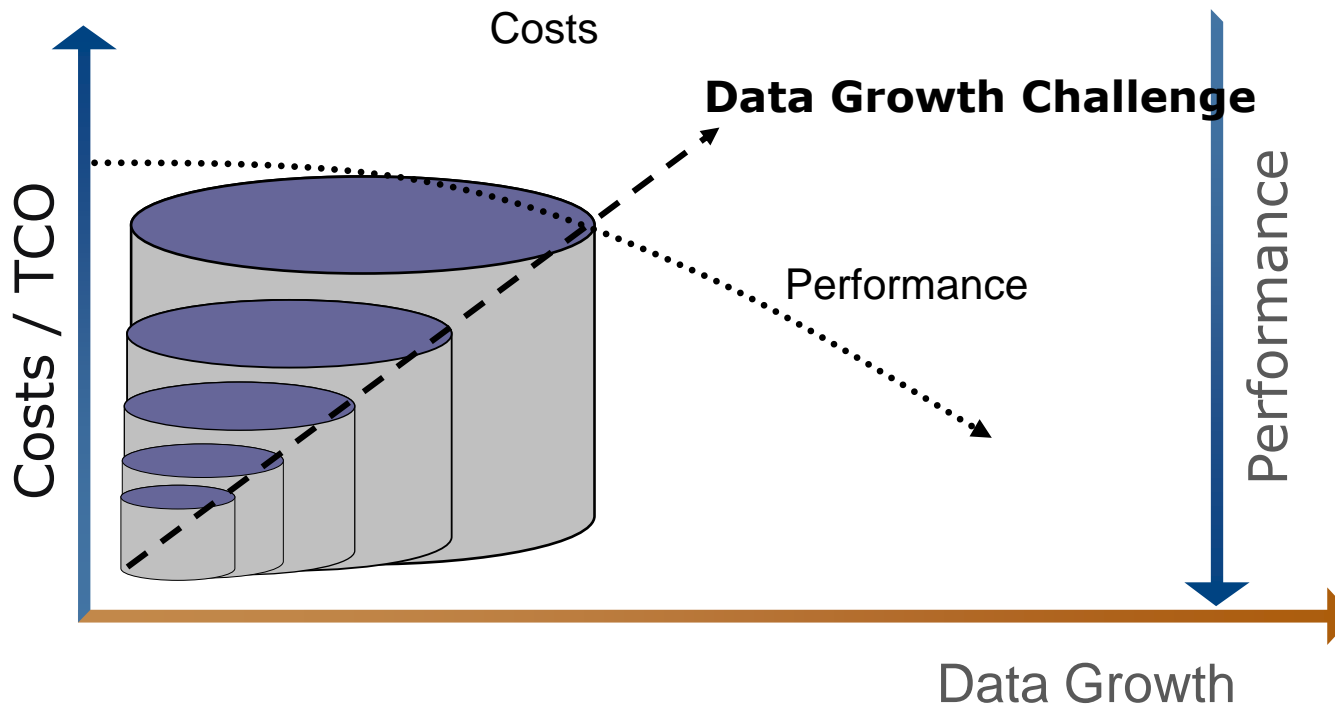
## MaxDB Database (status January 2011)

- max. database capacity: 4,250 GB
- occupied database capacity : 3,800 GB
- monthly growth of the data volume: about 110 GB
- reporting-relevant data volume: about 450 GB



# Motivation: Challenge Data Growth [1]

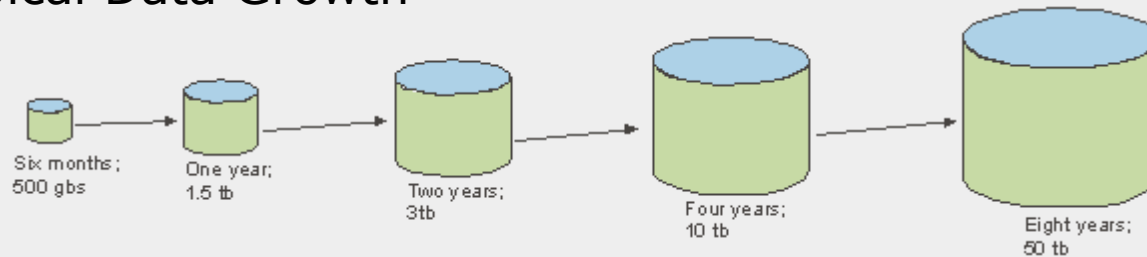
- **Costs increase**
- **Performance decreases**



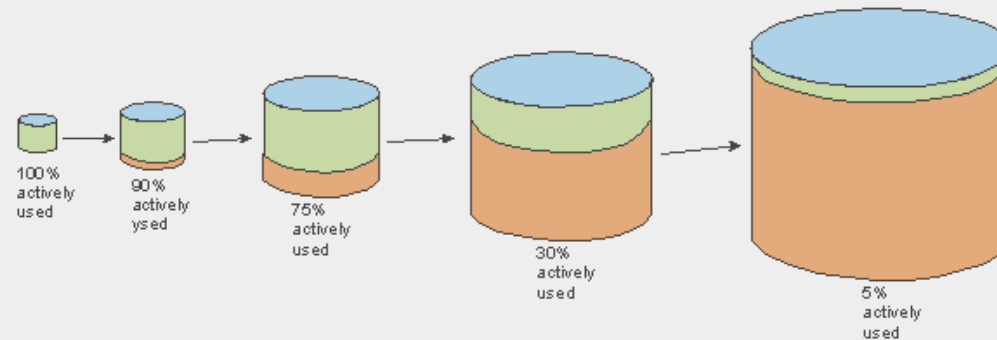


# Motivation: Challenge Data Growth [2]

## Typical Data Growth



## Typical Data Access vs. Data Growth



***The access probability changes significantly with the increasing data volumes***

# Initial Situation: SAP BW Accelerator

## **SAP BW Accelerator (BWA)**

- Configuration 4 x 16 GB + 1 Spare Blade: 64 GB RAM
- Main memory used: over 50%
- All reporting-relevant InfoProviders indexed

- The **increase of the data volume** has a **direct**, uncompensable influence on the **SAP BWA system utilization**.
- Thus **additional substantial BWA license costs are not avoidable**.

# Motivation: Cap Costs / Ensure performance

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Cap the largest cost driver (BWA license costs) by “freezing” the SAP BWA configuration



Ensure accepted performance



Reduce administration effort

# Nearline Storage - Essential Criteria / Implementation

# NLS/PBS: Essential Criteria for swb

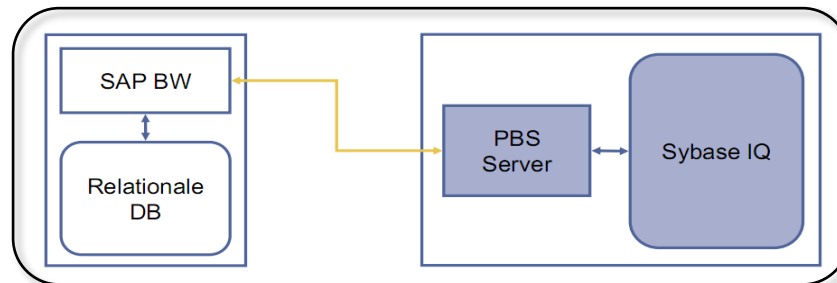
## Nearline Storage:

- Data is still available for reporting
- High SAP integration
- Huge data compression
- Very good performance due to column-based NLS DB
- Relieving the load on the SAP BW database

## PBS Software:

- Scalable for further systems (for example ERP, IS-U)
- Many years' experience with archiving solutions
- Useful additional tools (PBS BW Database Analyzer)

1 SAP BW : 1 NLS



# Nearline Storage: Implementation [1]

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## **Preparation work for the project**

- ILM quick check (system analysis, supplier recommendation)
- Supplier selection / selection of consultant / contact to users
- Cleanup the users in the productive SAP BW system
- Implementation enhancement package 1 as precondition (SAP BW 7.01)
- Setup of sandbox system

## **Realization of the project**

- Coaching approach (Hahne Consulting GmbH)
- Interviews with SAP BW system administrators and key users (power users) of the companies and dedicated departments to define the data to be archived
- Iterative procedure regarding concept, realization and archiving for each application

# Nearline Storage: Implementation [2]

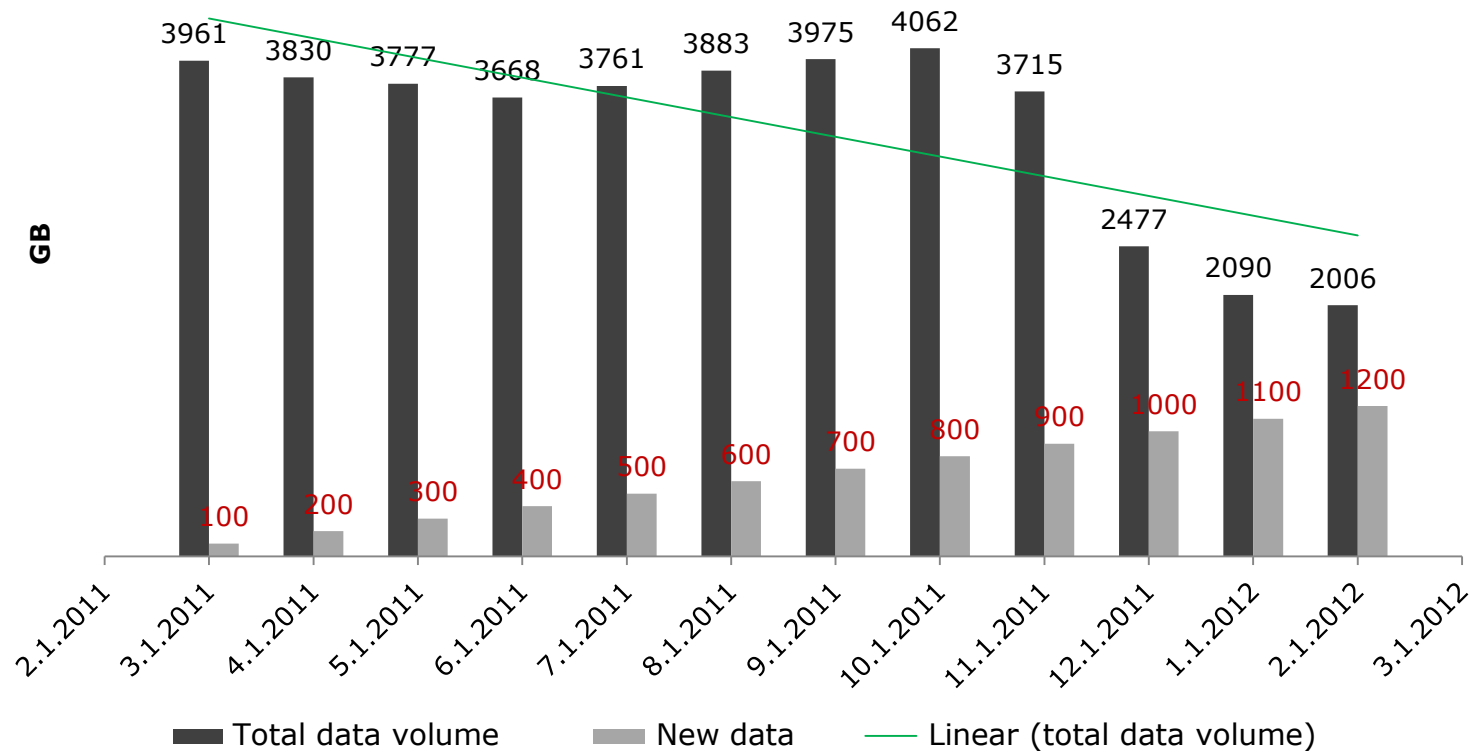
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## Key data of the project

- Period: 04/2011 – 02/2012
- Resources: 6 internal IT employees ("1+5")  
10 internal specialized employees  
1 external consultant
- License costs: 47,000 €  
(incl. Sybase IQ license and PBS BW Database Analyzer)
- Effort: 23 days for external staff  
35 days for internal IT  
10 days for internal specialized divisions  
10 days for basis administration

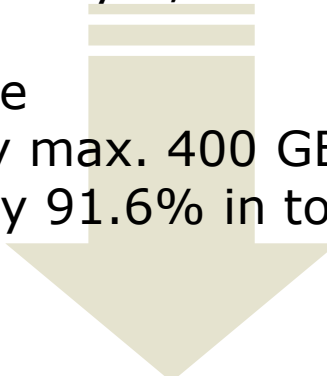
# Nearline Storage: Project Result / Success [1]

Data Volume BWP DB reduced by more than 50%





# Nearline Storage: Project Result / Success [2]

- SAP BW database
    - Data volume reduced by 2,650 GB (2.59 TB) in total
  - Nearline storage database
    - 224 GB occupied by max. 400 GB database capacity
    - Compression rate by 91.6% in total (SAP BW -> NLS)
- 

- *The **BWA configuration** could be **kept** unchanged up until today (06/2013)*
- *The **operation costs** were **stabilized***
- ***Administration effort** was **reduced**  
(for example time/capacity for DB backup, time for DB check)*

# Nearline Storage - Experiences

# Experiences: Queries / Performance

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- Online and NLS data can be displayed together in a query without problems.
- The users are satisfied with the response times for "mixed queries" and other queries that are directed exclusively against the nearline storage.
- Own tests resulted that response times for data from the nearline storage are much closer to those of the BWA than the SAP BW database.
  - 75,000 selected from 900,000 data records
  - BWA: 0.099s
  - NLS: 0.651s
  - MaxDB: 2.829s
- Performance of archiving/reloading is satisfactory

# Experiences: Operation / Support

- The application runs stable. There have not been any problems in the operation up to now.
- Relocation of the nearline storage system within a provider change worked well.
- PBS's support is competent, fast and helpful.
- Naming conventions for manual archiving jobs (SM37) helpful
  - for ex.: *BI\_ARCH\_InfoProv\_Archivingselection\_Status*

Jobname	
<input type="checkbox"/>	BI_ARCH_0TCT_C22_20110831_50
<input type="checkbox"/>	BI_ARCH_0TCT_C22_20110831_70
<input type="checkbox"/>	BI_ARCH_ZTCT_C01_20120707_70
<input type="checkbox"/>	BI_ARCH_ZTCT_C01_20120707_70

# Experiences: Influence in Processes / Procedures [1]

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- **Data model modifications**
  - SAP note 1005040
  - if necessary, postprocessing in additional virtual NLS providers
- **Data loading to older timeslices**
  - no other data can be loaded in the same InfoProvider to the timeslices that have already been archived in NLS
  - archived data to this timeslice of the InfoProvider had to be reloaded from NLS to the SAP BW database first

# Experiences: Influence in Processes / Procedures [2]

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- **Deletion of archiving requests**
  - only possible from SAP BW rel. 7.3  
(must be configured explicitly in the NLS monitor; 2-step procedure;  
ATTENTION with nearline requests without ADK -> timeslice remains locked)
- **BI projects have to take archiving aspects into account**
  - Definition of relevant archiving attributes
  - Definition of data slices for online, nearline and data to be deleted
  - Realize NLS objects

# Experiences: NLS Compression Rates [1]

InfoCube/DSO ZKW\_C76 Status of request: frm 70 to 80 new selection

Archiving Session Details

1 Entry

ID	DA Process	SAP request	Changed by	Stat...	Current Date	No. data records	Size/Bytes	NL request	Near-Line Object
	ZKW_C76	679.827	PRUESER	70	11.11.2011	63.271.693	124.012.518.280	679.832	/BIC/ZKW_C76

technical information for data archiving process

DA process	ZKW_C76
Request table	ZPBSBICBWP_ORZKW_C76
Nearline table	ZPBSBICBWP_ONZKW_C76__V0001

Table type	BASE	
SID entries	679.832	63.271.693
Total entries	63.271.693	
Columns	114	
Pages	407855	
Compressed Pages	406050	
NBlocks	1284949	

Size arch. data/GB	115,50
Size in NLS DB/GB	9,80
Compression to %	8

Data Browser  
Show structure  
Show structure  
NLS DB Indices

# Experiences: NLS Compression Rates [2]

The screenshot displays the SAP InfoCube/DSO interface for ZCCR\_C13. The main table shows one entry with 4,779,312 data records and a size of 3,001,407,936 bytes. The technical information section provides details about the DA process, request table, and nearline table, along with a summary of table statistics and archiving metrics.

ID	DA Process	SAP request	Changed by	Stat...	Current Date	No. data records	Size/Bytes	NL request	Near-Line Object
	ZCCR_C13	808.716	PRUESER	70	21.06.2012	4.779.312	3.001.407.936	820.438	/BIC/ZCCR_C13

technical information for data archiving process	
DA process	ZCCR_C13
Request table	ZPBSBICBWP_ORZCCR_C13
Nearline table	ZPBSBICBWP_ONZCCR_C13_V0001
Table type	BASE
SID entries	820.438
Total entries	4.779.312
Columns	42
Pages	2316
Compressed Pages	2078
NBlocks	11242

Size arch. data/GB	2,80
Size in NLS DB/MB	87,83
Compression to %	3



# Experiences: SAP Integration

## NLS Monitor:

NLS monitor for Nearline connection CBW\_IQ (PBSRIQ\_SAPNLSDB01@SWBNLPDB)

The screenshot displays the NLS Monitor interface for a Nearline connection. The main content area is divided into several sections:

- NLS database info:** Shows "NLS database is active" with a green status indicator.
- NLS Interface Info:** Shows "NLS interface is active" with a green status indicator.
- Nearline connection:** Displays the connection name "CBW\_IQ" and logical destination "PBSRIQ\_SAPNLSDB01@SWBNLPDB".
- Database Details:** Shows the database engine as "Sybase IQ" and version "15.2.0.5615/101123/P/ESD 2/Enterprise Linux64 - x86\_64 - 2.6.9-67.0.4.ELsmp/64bit/2010-11-23 1".
- Database Size:** Provides details on storage and file usage:

Minimize Storage	On (Permanent)	Page Size	131072/8192b1ksz/16bpp
Main DB Files	21	Main out of space	N
Temp. DB Files	20	Temp out of space	N
Main IQ Blocks Used	29471046 of 51340800, 57%=224Gb, Max Block#: 62468292		
Temp. IQ Blocks Used	708 of 12748800, 0%=5Mb, Max Block#: 2090928		
Main Reserved Blocks Available	51200 of 51200, 100%=400Mb		
Temp. Reserved Blocks Available	51200 of 51200, 100%=400Mb		
- Database Buffers:** Shows buffer usage for Main IQ Buffers (97963, 12288Mb Used: 97962, Locked: 0) and Temp. IQ Buffers (146944, 18432Mb Used: 43, Locked: 1).
- Backup:** Displays the last full backup ID (72940500) and time (2013-09-08 06:00:36), and the last backup ID (73386685) and time (2013-09-13 06:00:49).
- JDBC Driver:** Shows the driver name "jConnect (TM) for JDBC (TM)" and version "jConnect (TM) for JDBC(TM)/6.05(Bui1d 26515)/P/EBF16508/JDK14/Fri Jan 16 12:48:51 2009".

A navigation menu on the left lists various components like "NLS Database", "NLS Interface", and "Nearline processes". A secondary menu on the right lists specific monitoring items such as "NLS Database", "NLS Interface", "DAP Nearline", and "Snapshot ADK".

# Experiences: Useful Tools

## PBS BW Database Analyzer:

- Distribution according to time characteristic (helpful also for other analyses)
- Capacity analysis
- Data Browser
- Reporting for analysis results (cubes)

*Evaluation of distribution according to time characteristic*

BW Analyzer: Distrib. acc. to time char. PRUESER  
 Run 0006 ZAF0\_Cubes (C20 - C29) Date: 13.09.2013  
 Page 1 Run date: 05.07.2012

InfoProvider	Table	Time caracte	Year	Period	FISCVARNT	Number	%	Size (KB)
ZAF0_C22	Fact table	GCALMONTH						
			2011	001		162.919	-	-
			2011	002		62.980	-	-
			2011	003		266.604	-	-
			2011	004		546.666	-	-
			2011	005		1.049.256	-	-
			2011	006		1.391.098	-	-
			2011	007		666.662	-	-
			2011	008		1.016.096	-	-
			2011	009		4.115.979	-	-
			2011	010		4.870.641	-	-
			2011	011		5.126.825	-	-
			2011	012		4.249.651	-	-
			2011	===		23.525.377	-	-
			2012	001		6.851.855	-	-
			2012	002		5.902.846	-	-
			2012	003		4.313.356	-	-
			2012	004		3.249.648	-	-
			2012	005		1.048.913	-	-
			2012	===		21.366.618	-	-
			====	===	===	44.891.995	-	-

*Capacity display BW InfoProvider*

InfoCubes | DataStore objects | PSA tables

BW ANALYZER: Disk space occupancy of BW InfoProviders Time 10:51:14 PRUESER  
 Capacity run no. 0037 of 26.06.2013 : Date 13.09.2013  
 WAVE\_VERKAUFSSTATISTIK Total capacity (DB): 169.458.936 KB

InfoCube analyse type: Fact and dimension tables Page 1  
 PSA analysis type: Only current version

InfoCubes: analyzed Total fact/dimension tables (DB): 169.458.936 KB  
 DataStore objects: analyzed Total data in DataStore objects (DB): 0 KB  
 PSA tables: analyzed Total PSA tables (DB): 0 KB

DAP name	InfoCube	Name InfoProvider	Size (KB) Fact table	Size (KB) dim. tables
<b>InfoCubes</b>				
ZKW_C72	ZKW_C72	Sales Statistics (Basic Key Figures)	34.044.992	1.523.960
ZKW_C71	ZKW_C71	Sales Statistics (Basic Key Figures)	33.798.440	1.502.720
ZKW_C70	ZKW_C70	Sales Statistics (Basic Key Figures)	25.819.272	1.369.776
ZKW_C79	ZKW_C79	Sales Statistics (Basic Key Figures)	25.514.776	1.357.872
ZKW_C78	ZKW_C78	Sales Statistics (Basic Key Figures)	25.044.240	1.577.320
ZKW_C73	ZKW_C73	Sales Statistics (Basic Key Figures)	10.375.216	482.744
ZKW_C76	ZKW_C76	Sales Statistics (Basic Key Figures)	1.005.720	1.368.136
ZKW_C75	ZKW_C75	Sales Statistics (Basic Key Figures)	965.944	1.365.800
ZKW_C77	ZKW_C77	Sales Statistics (Basic Key Figures)	962.848	1.377.992
ZKW_C74	ZKW_C74	Sales Statistics (Basic Key Figures)	224	944

# Conclusion, Outlook, Questions

# Conclusion – Outlook - Questions

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## Conclusion

- Running of project has resulted early in a system load reduction.
- Know-how was built up in the company by the coaching approach.
- Project result leads to a stabilization of the total cost for the SAP BW operation after database reorganization.
- As announced, NLS performance is higher than that of the SAP BW database
- NLS more cost-efficient vs. BWA enhancement.
- The choice of software vendor and implementation partner fitted exactly for swb.

## Outlook

- Rebuild of virtual providers and if necessary, using SAP BW 7.30 functionality for the reporting layer at the end of 2013

Thank you very much for  
your attention!

swb AG  
Theodor-Heuss-Allee 20  
28215 Bremen  
Germany

Gert Prüser  
T: 0421 - 359 2991  
M: 0172 - 410 65 13  
E: gert.pruesser@swb-gruppe.de

info@swb-gruppe.de  
www.swb-gruppe.de

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# Backup

# Experiences: Permitted Data Model Changes

## (excerpt from SAP note 1005040)

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The following type and structure changes in an InfoCube or a DataStore object are permitted when you use near-line storage:

- You can add new characteristics and key figures.
- You can increase the length of characteristics of the 'CHAR' data type.
- You can change characteristics of the 'DATS', 'NUMC' and 'TIMS' data types to the 'CHAR' data type if you do not reduce the character length.
- You can change characteristics of the 'DATS' and 'TIMS' data types to the 'NUMC' data type if you do not change the character length.
- You can change key figures of the 'INT4' data type to the 'DEC' , 'CURR', or 'QUAN' data types, if you do not reduce the value range (number of places before the decimal point).
- For key figures of the 'CURR', 'DEC' and 'QUAN' data types, you can increase the value range (number of places before the decimal point) or the accuracy (number of decimal places).
- You can change key figures of the 'CURR', 'DEC' and 'QUAN' data types to the 'INT4' data type if you increase the value range.
- You can assign a characteristic to a different dimension in an InfoCube.

You cannot make changes to the type or the structure that are not listed here if you have already stored data in the near-line storage.