IBM DB2 with BLU acceleration

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Agenda

- DB2 10.5 with BLU Acceleration
- Integration of BLU with SAP
- DB2 Performance & Compression Examples
The Seven Big Ideas of DB2 with BLU Acceleration

- Data Mart
- Analytics
- Super Fast
- Super Easy
- Column Store
- Simple to Implement and Use
- Extreme Compression
- Data Skipping
- Optimal Memory Caching
- Core-Friendly Parallelism
- Deep HW Instruction Exploitation (SIMD)
7 Big Ideas: Massive Compression

- Massive compression with approximate Huffman encoding
  - More frequent the value, the fewer bits it takes

<table>
<thead>
<tr>
<th>LAST_NAME</th>
<th>Encoding</th>
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<tbody>
<tr>
<td>Johnson</td>
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</tbody>
</table>
7 Big Ideas: Data Remains Compressed During Evaluation

- Encoded values do not need to be decompressed during evaluation
  - Predicates and joins work directly on encoded values

```sql
SELECT COUNT(*) FROM T1 WHERE LAST_NAME = 'SMITH'
```

<table>
<thead>
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<tr>
<td>Sampson</td>
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<td>Smith</td>
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</tr>
</tbody>
</table>
7 Big Ideas: Multiply the Power of the CPU

- Performance increase with Single Instruction Multiple Data (SIMD)
- Using hardware instructions, DB2 with BLU Acceleration can apply a single instruction to many data elements simultaneously
  - Predicate evaluation, joins, grouping, arithmetic
7 Big Ideas:  3  Core-Friendly Parallelism

• Careful attention to physical attributes of the server
  – Queries on BLU Acceleration tables automatically parallelized
7 Big Ideas: Column Store

- **Minimal I/O**
  - Only perform I/O on the columns and values that match query
  - As queries progress through a pipeline the working set of pages is reduced

- **Work performed directly on columns**
  - Predicates, joins, scans, etc. all work on individual columns
  - Rows are not materialized until absolutely necessary to build result set

- **Improved memory density**
  - Columnar data kept compressed in memory

- **Extreme compression**
  - Packing more data values into very small amount of memory or disk

- **Cache efficiency**
  - Data packed into cache friendly structures
7 Big Ideas: Scan-Friendly Memory Caching

- New algorithms cache in RAM effectively

  - High percent of interesting data fits in memory
    - We leave the interesting data in memory with the new algorithms

- Data can be larger than RAM
  - No need to ensure all data fits in memory
  - Optimization for in memory and I/O efficiency
7 Big Ideas: **6** Data Skipping

- Automatic detection of large sections of data that do not qualify for a query and can be ignored

- Order of magnitude *savings in all of I/O, RAM, and CPU*

- No DBA action to define or use – truly invisible
  – Persistent storage of min and max values for sections of data values
7 Big Ideas: Simple to Implement and Use

- **BLU is part of DB2**
  - Same DB2 process model, storage, utilities

- **Rich function and admin tools**
  - Same SQL, language interfaces, administration
  - Rich existing DB2 admin utilities and tools

- **Reliability**
  - Majority of the system is mature DB2 code
  - New code is validated with *hundreds of thousands* of existing DB2 test cases, stress systems, and performance measurements.
BLU Acceleration: 10TB Query, Seconds or Less

32 cores
1TB memory
10TB table
100 columns
10 years data

SELECT COUNT(*) from MYTABLE
where YEAR = '2010'

Data Skipping reduces to 1GB
Column Processing reduces to 10GB
Actionable Compression reduces to 1TB
In-memory

Massive Parallel Processing
32MB linear scan on each core

Vector Processing
Scans as fast as 8MB through POWER7 Accelerated SIMD

Result in seconds or less
Agenda

• DB2 10.5 with BLU Acceleration

• Integration of BLU with SAP

• DB2 Performance & Compression Examples
IBM DB2 Roadmap for SAP solutions

2009  SAP’s new products, integration of Rational development test suite, new SAP A1 packages for GB, reference architectures

2008  **SAP migrated major business systems to DB2**, Tivoli + SAP Solution Manager integration improvements in SAP monitoring, SAP packages on IBM Business Servers, Live Partition Migration, SAP Upgrades/ Migrations, UNICODE conversions, reference architecture Banking

2007  IBM BladeCenter running SAP Enterprise Search, Enabling virtualization capabilities, Starting certification of Rational Suite

2006  IBM BladeCenter running SAP NetWeaver BW Accelerator, Optimizing JAVA stack

2005  **IBM DB2 optimized for SAP software**, Dynamic Infrastructure for SAP Adaptive Computing

2004  Announcement of Retail Alliance

2003  Foundation of the Collaboration Technology Support Center

2002  IBM and SAP establish joint SCM Center of Excellence

2001  IBM and SAP form a Strategic Alliance

1999  **DB2 becomes the strategic database for SAP**

1996  Foundation of Lotus and Tivoli Centers of Excellence

1993  Foundation of the IBM SAP International Competence Center

1972  IBM becomes Logo and Development Partner of SAP
Over 100 SAP customers have migrated to DB2 in past few months, WHY?

Optimize Performance

- DB2 leads in benchmarks certified by SAP
- Reduced i/o & network traffic with DB2 compression
- DPF (Database Partitioning Feature) provides horizontal unlimited scalability
- Multi-Dimensional Clustering improves ad hoc query Performance

Operational Excellence

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

Reduce Costs

- Lower database license and maintenance charges
- Minimize storage footprint by 55%-68% due to DB2 compression
- Lower infrastructure costs
- Avoid unnecessary upgrades
- Complete out-of-the-box solution
Unbeatable value proposition for you as the SAP customer

Reduce total SAP Database Infrastructure Cost > 20%

Reduce SAP storage needs compared to Oracle 55% - 68%

Reduce license and maintenance cost by (Oracle) 38% - 74%

#1 in performance to SAP customers:
- Faster than Oracle for R/3 20+%  
- Faster than Oracle for BW 40+%  
- Unlimited scale out for SAP BI above 100 TB

The Strategic Database for SAP:
- Faster access to leverage new database advances for SAP 2+ Years

Integrated development. Aligned maintenance. One-stop service and support:
- Technical innovations that will help your customer save money
DB2 10.5 for LUW – Highlights for SAP

**Extreme Performance**
- Column-organized Tables
- **DB2 BLU** feature

**Low Operational Cost**
- Reorg Avoidance
- DB2 ACS Script Interface
- STMM Member Individual Tuning

**Reliability / Availability**
- Rolling DB2 FixPak update
- Comprehensive DR solution
- Online add member

**SAP Integration**
- SAP BW,
- DB2 Near-Line Storage for SAP BW,
- SAP OLTP,
- DBA Cockpit
- ABAP Dictionary
- Installation, Upgrade, Migration,
- DB6Conv, R3Load, db6_update_db
DB2 10.5 released for SAP Software

**First phase:** On August 8, 2013 SAP certified DB2 10.5
- SAP certification happened 8 weeks after IBM GA (June 15, 2013)
- The strong development partnership between IBM and SAP has not changed
- SAP has certified DB2 10.5 for SAP NetWeaver 7.0 SR 3 and higher see SAP Notes: 1851853, 1851832, 1555903)

**Second phase:** On December 3, 2013 SAP released DB2 10.5 FP 1 with **BLU Acceleration**
- Supported SAP applications are:
  - SAP NetWeaver BW 7.00 and higher
  - DB2 specific SAP BW Near-Line Storage 7.01 and higher
- SAP delivers DB2 10.5 BLU extensions with SAP BW Support Packages
- In this phase only Info Cubes are supported, other SAP BW objects will follow later
Introducing **BLU Acceleration**

IBM Research & Development Lab Innovations

- **Dynamic In-Memory**
  - In-memory columnar processing with dynamic movement of data from storage data

- **Actionable Compression**
  - Patented compression technique that preserves order so that the data can be used without decompressing

- **Parallel Vector Processing**
  - Multi-core and SIMD parallelism (Single Instruction Multiple Data)

- **Data Skipping**
  - Skips unnecessary processing of irrelevant data

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Super Fast, Super Easy — *Create, Load and Go!*

No Indexes, No Aggregates, No Tuning, No SQL changes, No schema changes
Seamless Integration into DB2

Built seamlessly into DB2 – integration and coexistence
- Column-organized tables can coexist with existing, traditional, tables
  - Same schema, same storage, same memory

Same SQL, language interfaces, administration
- Column-organized tables or combinations of column-organized and row-organized tables can be accessed within the same SQL statement

Dramatic simplification – Just “Load and Go”
- Faster deployment
  - Fewer database objects required to achieve same outcome
- Requires less ongoing management
  - due to it’s optimized query processing and fewer database objects required
- Simple migration
  - Conversion from traditional row table to BLU Acceleration is easy
  - Users only notice speed up; DBA’s only notice less work!

The Seven Big Ideas of DB2 with BLU Acceleration
How fast is it?

Results from the DB2 10.5 2nd Alpha Customer Tests

<table>
<thead>
<tr>
<th>Workload</th>
<th>Speedup over DB2 10.1</th>
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</thead>
<tbody>
<tr>
<td>Large Financial Services Company</td>
<td>46.8x</td>
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<tr>
<td>Global ISV Mart Workload</td>
<td>37.4x</td>
</tr>
<tr>
<td>Analytics Reporting Vendor</td>
<td>13.0x</td>
</tr>
<tr>
<td>Global Retailer</td>
<td>6.1x</td>
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<tr>
<td>Large European Bank</td>
<td>5.6x</td>
</tr>
<tr>
<td>Internal Benchmark Test</td>
<td>3.0x</td>
</tr>
</tbody>
</table>

10x-25x improvement is common
BLU Support for SAP Business Warehouse

Details on the implementation can be found in the following OSS Notes:

- 1555903 - DB6: Supported DB2 Database Features
- 1851853 - DB6: Using DB2 10.5 with SAP Applications
- 1819734 - DB6: Use of BLU Acceleration
- 1825340 - DB6: Use of BLU Acceleration with NetWeaver BW
- 1889656 - DB6: Mandatory SAP NW BW corrections for BLU Acceleration
- 1834310 - DB6: Use of DB2 BLU Acceleration with DB2 near-line storage

BW systems must be at the correct Support Package version (see OSS Note 1825340), followed by the application of the OSS Note correction (SNOTE) in OSS Note 1889656:

- Near-Line Storage implementation with BLU will also require application of corrections described in OSS Note 1834310
- Corresponding newer Support Packages for each BW version will be released in Jan 2014 that will incorporate the corrections described in OSS Notes 1889656 and 1834310

Existing DB2 ASL customers (bought DB2 OEM via SAP) are entitled to the free upgrade from previous DB2 versions to DB2 10.5 and all features contained therein.
## Required SAP Support Packages for BLU

### Minimum SPs (additional mandatory corrections required):

<table>
<thead>
<tr>
<th>SAP BW Rel.</th>
<th>SAP Basis</th>
<th>SAP BW</th>
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<td>SP14</td>
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<tr>
<td>7.40</td>
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<td>SP05</td>
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</tbody>
</table>

See details in SAP Note 1889656:
- DB6: Mandatory SAP NW BW corrections for BLU Acceleration
SAP BW Objects on BLU (Columnar) Tables

Benefits
- Faster BW Reports
- No query tuning required
- Less SAP BW ETL processing steps

Less storage required:
- No secondary indexes on BLU
- Improved compression
- Less Aggregates
- Less InfoCubes

BLU Rollout:
Phase 1: December 2013
**BLU Data Compression for SAP BW**

- Column dictionaries are created automatically
- No secondary indexes on CDE tables
  
  ➔ Space savings
- First results with DB2 Load Utility
  - Internal tests with Benchmark data:
    
    table size is up to factor 2x smaller compared to DB2 10.1 Adaptive Compression
- SAP applications use CLI load and SQL INSERT, for example:
  - SAP Heterogenous System Copy (R3load): uses CLI Load for large tables
  - ETL processing: uses SQL INSERT
DB2 Nearline Storage Solution for SAP BW

- Infrequently accessed data can be moved to NLS. BW provides transparent online access to both BW and NLS database
- NLS objects are implemented as DB2 BLU tables or DPF tables
- DB2 NLS can be connected to SAP BW systems running on non-DB2 databases
- Available with SAP NetWeaver BW 7.01 SP6 and higher
- The NLS interface is part of SAP BW
- Fully integrated into SAP tools (SAPInst, DBA Cockpit, ...)
- Existing SAP DB2 support channel is used
- SAP Note 1405664: DB6 Near-Line Storage Implementation
**DB2 NLS support for SAP BW on HANA**

- **Major advantage: TCO reduction**
  - Reduced data volume on SAP HANA
  - Smaller HANA box is sufficient
  - Reduced SAP HANA license cost

- **Existing DB2 NLS solution is extended to support SAP BW on HANA since 07/2012**
  - Existing NLS interface is used
  - Fully integrated
  - Support of HANA optimized BW InfoObjects
  - SAP notes: 1807855, 1695150
BLU vs. SAP BW Accelerator

- **BLU Advantages:**
  - Low memory footprint: **Only active data stays in memory**
  - Simplicity of BLU: **No separate appliance required with BLU (BWA is a separate box):**
    - BWA needs additional administration
    - BWA must be updated constantly with data from SAP BW
    - Data load requires additional time (ETL) and causes additional workload on SAP BW.
  - BLU requires less hardware: **When migrating from SAP BW/ORACLE/BWA to DB2 BLU we can reduce amount of hardware (CPU/memory)**
  - Low TCO
BLU vs. SAP HANA

BLU Advantages:

- **Low memory footprint**
  - Only active data stays in memory. Therefore also fast database start and restart times
- **Low storage footprint.** Sizing guidelines for HANA (1):
  - DISK(persistence) = 4 x RAM(total)
  - DISK(logs) = 1 x RAM(total)
- Low Maintenance & High Availability: **BLU does not require frequent patching**
- Low Risk:
  - Accelerates BW Reports without requirement for SAP BW upgrade
  - DB2 is long proven technology
  - Large number of client references
- Simplicity: **BLU requires no tuning**
- Low TCO

(1) http://scn.sap.com/community/hana-in-memory/blog/2013/01/17/sap-hana-sizing
Agenda

• DB2 10.5 with BLU Acceleration
• Integration of BLU with SAP
  – Other Enhancements with DB2 for SAP
• DB2 Performance & Compression Examples
DB2 Optimizations for SAP Profitability Analysis (COPA)

- SAP COPA is a SAP ERP module for reporting sales and profit data using different customized characteristics (such as customer, country, product) and key figures (such as cost, price).
- SAP COPA generates complex SQL queries with large number of aggregated rows (several 100 Million records).
- SAP default: DB2 parallel processing is switched OFF for SAP ERP.
- SAP optimizer profiles can be used to switch on DB2 parallel processing on COPA tables (like CE1IDEA, CE3IDEA, CE4IDEA) using the SAP optimizer profile `<DEGREE VALUE="ANY" />` (see SAP note 1818503)

=> Benefit: Significant performance improvements with DB2 parallel processing

IBM Lab Results:
- DB2 parallel degree increased from 1 -> 8
  - up to factor 4x faster
- DB2 parallel degree increased from 1 -> 16
  - up to factor 7x faster

Customer Results:
- up to factor 3.8x faster
- in average factor 1.8x faster

![Graph showing performance improvements](image)
DB2 pureScale enhancements

- HADR support
- Online Reorg support
- Explicit Hierarchical Locking
  - Improved performance
  - No CF communication, if one member accesses data only
- STMM member-individual tuning
  - Planned to be the default for pureScale deployments
- Online add member
DB2 pureScale: Rolling Fix Pack Updates

Two member cluster (each at GA level) with clients (C) connecting into each member
1. Member 1 is quiesced so clients all move to member 2
2. DB2 binaries updated on member 1
   - Code level is now at FP1, but effectively running at GA level still
3. Member 1 started again and a portion of the clients get rerouted to member 1 to balance the workload
4. Member 2 is quiesced so clients all move to member 1
5. DB2 binaries updated on member 2
   - Code level is now at FP1, but effectively running at GA level still
6. Member 2 started again and a portion of the clients get rerouted to member 2 to balance the workload

At this point, code is at FP1 level, but can't use any FP1 features; can test stability and roll down to GA level if necessary

7. Updates are committed

The instance is now completely running at FP1 and new features can be used; cannot roll down to GA any longer
Agenda

• DB2 10.5 with BLU Acceleration
• Integration of BLU with SAP
• DB2 Performance & Compression Examples
IBM achieves new WORLD RECORD (DB2 10.5)  
3-Tier SAP SD Benchmark, 266k SAP Users¹

Featuring 64-core IBM Power® 780 AIX® 7.1 & DB2® 10.5

DB2 on Power has held the leadership result for the highest number of SAP SD users on the three-tier SAP SD standard application benchmark for over 7 years²

Results of DB2® 10.5 on IBM Power 780 on the three-tier SAP SD standard application benchmark on SAP enhancement package 5 for SAP ERP 6.0, achieved 266,000 SAP SD benchmark users, certification # 2013010. Configuration: 8 processors / 64 cores / 256 threads, POWER7+ 3.72 GHz, 512 GB memory, running AIX 7.1

Results of DB2® UDB 8.2.2 on IBM eServer p5 Model 595 on the three-tier SAP SD standard application benchmark running SAP R/3 ® Enterprise 4.70 (ERP) software, achieved 168,300 SAP SD benchmark users, certification # 2005021. Configuration: 32-core SMP, POWER5, 1.9 GHz, 256 GB memory, running AIX 5.3

Results of Oracle 11g Real Application Clusters (RAC) on SAP sales and distribution-parallel standard application benchmark running the SAP enhancement package 4 for SAP ERP 6.0, achieved 180,000 SAP SD benchmark users, certification # 2011037. Configuration: 8 x Sun Fire X4800 M2 each with 8 processors / 80 cores / 160 threads, Intel Xeon Processor E7-8870, 2.40 GHz, 8 x 512 GB memory, running Solaris 10

Source: http://www.sap.com/benchmark

1) Results of DB2® 10.5 on IBM Power 780 on the three-tier SAP SD standard application benchmark on SAP enhancement package 5 for SAP ERP 6.0, achieved 266,000 SAP SD benchmark users, certification # 2013010. Configuration: 8 processors / 64 cores / 256 threads, POWER7+ 3.72 GHz, 512 GB memory, running AIX 7.1

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First Customer Quotes on DB2 10.5 BLU
Significantly Less Storage, Better Performance

“10x. That's how much smaller our tables are with BLU Acceleration. Moreover, I don't have to create indexes or aggregates, or partition the data, among other things. When I take that into account in our mixed table-type environment, that number becomes 10-25x.”
-Andrew Juarez, Lead SAP Basis and DBA

“When I converted one of our schemas into DB2 10.5 with BLU Acceleration tables, the analytical query set ran 4-15x faster.”
-Andrew Juarez, Lead SAP Basis and DBA

“What was really impressive is the fact that we could get significantly better performance with DB2 10.5 using BLU Acceleration without having to create indexes or aggregates on any of the tables. That is going to save us a lot of time when designing and tuning our workloads.”
-Kent Collins, Database Solutions Architect, BNSF Railway

“When we compared the performance of column-organized tables in DB2 to our traditional row-organized tables, we found that, on average, our analytic queries were running 74x faster when using BLU Acceleration.”
-Kent Collins, Database Solutions Architect, BNSF Railway
Anonymous Customer (Europe)

Large Energy Provider

**PoC Goals:**

- Performance (Reporting & Batch):
  
  Compare **DB2 BLU vs. ORACLE vs. SAP HANA**
Performance – DB2 BLU vs. HANA

- DB2 with BLU Acceleration on ½ the cores with ½ the RAM as SAP HANA and DB2 ran 12.5% faster than SAP HANA for SAP BW
  - Customer had already performed extensive tuning of SAP HANA under BW
    - No tuning was done for DB2 – just load and run
  - HANA running on 2x more cores and 2x more RAM
  - HANA server had 2x more SAPS capacity

- DB2 BLU server
  - 40 cores = IBM X3950 (4x10) Intel Westmere CPUs
  - 512GB RAM
  - 4.8TB HDD internal drives PLUS 1.2TB SSD drive
  - SLES 11
  - ~ 68000 SAPS

- SAP HANA server
  - 80 cores = ProLiant DL980 G7 (8x10) Intel Westmere CPUs
  - 1 TB RAM
  - 8.8TB HDD external drives PLUS 1.2TB SSD drive
  - SLES 11
  - ~ 129000 SAPS
Fossil: Global retailer specializing in the design, innovation, and marketing of fashion lifestyle and accessory products with headquarters in Dallas (U.S.).

BLU PoC Goals:
✓ Query Performance:
  Compare **DB2 10.5 BLU** with **SAP BW Accelerator**
✓ Storage Consumption:
  Check additional BLU compression savings
BLU PoC for Fossil - Test Environment

Production System (for SAP BWA Tests)

- BW Query
- BW 7.30 SP05
- DB2 10.1
  - 8 cores, 64 GB
- AIX 7.1
- 6 blades

Test System (for DB2 BLU Tests)

- BW Query
- BW 7.30 SP05
- DB2 10.5 BLU
  - 10 cores, 100 GB
- AIX 7.1

⇒ DB2 BLU uses ~5 x less cores than SAP BWA
⇒ SAP BWA was used in production: tests were performed during hours of low workload
Performance Test Results

<table>
<thead>
<tr>
<th>SAP BW Reports on MultiProviders</th>
<th>Isolated Test Environment, Hot Run</th>
<th>Production Environment, Hot Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>(multiple concurrent SQL statements per BW Report)</td>
<td>DB2 row-based (BR9) INTRA_PARALLEL=YES, no DB2 Compression</td>
<td>DB2 columnar (BR9)</td>
</tr>
<tr>
<td></td>
<td>DB2 row-based (BRP) INTRA_PARALLEL=YES, without DB2 Compression</td>
<td>SAP BWA</td>
</tr>
<tr>
<td></td>
<td>OLAP</td>
<td>DB</td>
</tr>
<tr>
<td>1 YRPA_MC03_QR110_S</td>
<td>9.8</td>
<td>42.4</td>
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<tr>
<td>2 ZRPA_MC13_QR01_V4</td>
<td>2.5</td>
<td>5.1</td>
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<tr>
<td>3 ZRPA_MC03_QR16_TRAFFIC_70</td>
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<td>26.6</td>
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<td>6 ZRPA_MC03_QR102_1</td>
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</tr>
<tr>
<td>7 ZRPA_MC03_QR16_70</td>
<td>1.3</td>
<td>2.0</td>
</tr>
</tbody>
</table>

BLU is ~factor 10 faster than DB2 for long running Queries

BLU and BWA provide similar Performance*

*No exact apples-to-apples comparison, because BWA used much more hardware and was not tested in isolated environment
Storage Reduction with BLU

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BLU tables reduce table- and indexe space by **93%** (sum of converted tables)
Knorr-Bremse is a German manufacturer of braking systems for rail and commercial vehicles that has operated in the field for over 100 years. The company also produces door systems for rail vehicles and torsional dampers. In 2009, the Group's workforce consisted of 14,000 employees.

BLU PoC Goals:
✓ Query Performance:
  Compare DB2 9.7 with DB2 10.5 BLU
Knorr Bremse – Performance Results

Results: Report Performance

Test Conditions

- Measurement of the total Report Runtime (incl. SAP BW)
- Focus: Reports using the Sales Cube (12 Mio records, 200 attributes)
- Test of different reports (slow & fast running reports)
Anonymous Customer (U.S.)

Food Industry

BLU PoC Goals:
✓ Query Performance:
  Compare **DB2 10.5 BLU** with **SAP BW Accelerator**
✓ Storage Consumption:
  Check additional BLU compression savings
Test Environment

Production System (for SAP BWA Tests)

- BW Query
- BW 7.01 SP09
  - 64 GB, 2460 SAPS
- DB+CI
  - 84 GB, 4915 SAPS
- AIX 7.1

Test System (for DB2 BLU Tests)

- BW Query
- BW 7.01 SP09
  - 40 GB
- DB2 10.5 BLU
  - 80 GB
  - 8 cores, 128 GB
- AIX 7.1

⇒ DB2 BLU and BW Accelerator use different hardware
⇒ SAP BWA was used in production: tests were performed during hours of low workload
Performance Results

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- BLU and BW Accelerator showed similar performance
- But BW Accelerator used ~3 x more cores than BLU
DB2 Storage Reduction with BLU

DB2 Adaptive Compression results (Top 300)

Overall reduction: 79% 63%
Average reduction: 69% 57%

Additional Savings with BLU (1): 61% (Tables + Indexes)

(1) Compared to size of DB2 compressed row-based tables+indexes (Top 22 BLU tables)
Conclusions based on recent PoC Results

**DB2 BLU vs. SAP BW Accelerator**
- BLU requires less cores to deliver similar performance
- BLU requires less memory. Only active data is loaded into memory
- BLU can simplify the landscape: no separate appliance required, no data load to BWA required, data quickly available for reporting
- BLU runs out of the box. No secondary indexes and no tuning required

**BLU vs. SAP HANA**
- BLU requires less cores to deliver similar or better performance
- BLU requires less memory. Only active data is loaded into memory
- BLU requires significantly less storage (check SAP sizing guidelines for HANA)
- BLU is built on mature and proven DB2 technology: no frequent patching required
- BLU can be used without upgrading SAP BW to latest release

**DB2 BLU provides lower Total Cost of Ownership**
Proposed Next Steps – DB2 BLU Proof of Concept

- **Requirements**: IBM & customer's BW team to identify and run relevant test cases
- **Test Cases**: selection of BW Reports based on execution frequency, database runtime, and business relevance (check SAP Early Watch and BW statistics)

**Overview of technical steps:**
- Clone production system
- SAP System Copy to test environment
- InfoCube conversion to DB2 BLU
- Execution of BW Reports

**Deliverables**: Runtime results, storage savings with DB2 BLU

**Estimated effort**: 3 weeks (for technical tasks)
Topics covered by the *SAP DB2 Center of Excellence*

• DB2 Proof of Concepts with...
  —...DB2 ESE -> for all SAP NetWeaver based systems. KPIs mostly related to *Storage Savings* & *Performance improvements*
  —...pureScale (on PDTX or other HW) -> for SAP ERP
  —...BLU (DB2 10.5) -> columnar tables for SAP Business Warehouse

• Pre- and post- migration support
• DB2 for SAP education and knowledge transfer
• DB2 for SAP CritSit support
• Presales support (briefings, presentations, etc)
• Other projects: e.g. Whitepapers, Redbooks, investigations, ...