

A decorative graphic on the left side of the slide features several overlapping circles in various colors (red, blue, green, orange, yellow, teal) connected by thin green lines, resembling a network or data flow diagram.

SAP NetWeaver BW on IBM Smart Analytics System 7700 strikes SAP NetWeaver BW on Teradata

Session Number 1314

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IBM Software

Information On Demand **2011**

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Agenda



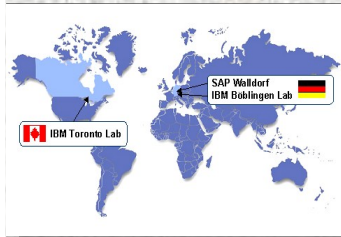
- Overview SAP NetWeaver BW on IBM DB2 for LUW
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versus SAP NetWeaver BW on Teradata
- Summary



The four Pillars of „IBM DB2 Optimized for SAP“

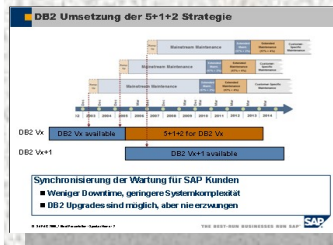


Partnership



Joint SAP and IBM teams working on all aspects of the product

Product Integration



One product, one maintenance strategy, one-stop service

Technology Innovation



Joint technology roadmap with agreed deliverables

SAP runs DB2



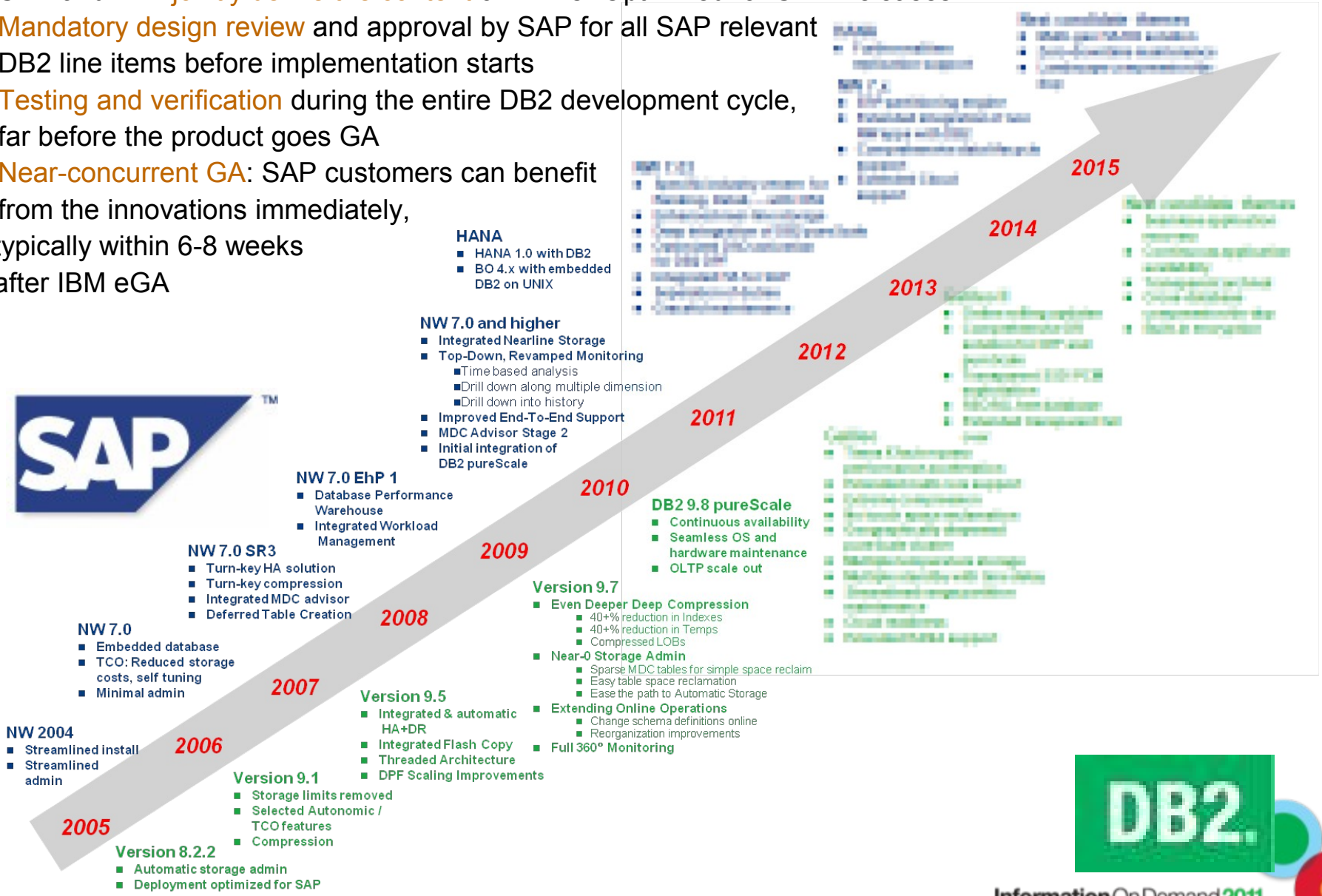
DB2 is a widely used database platform at SAP IT



DB2 Optimized for SAP – Roadmap

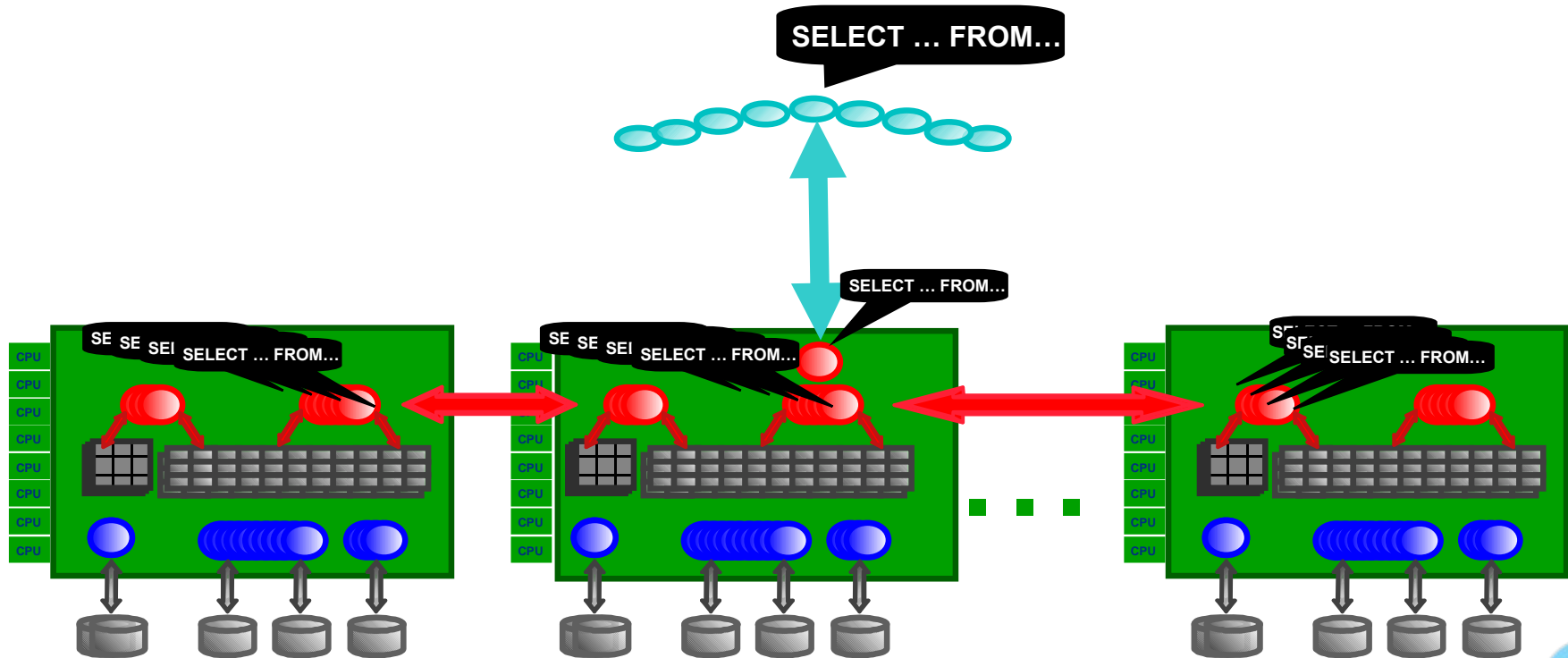


- SAP and IBM **jointly define the content** of DB2's "Optimized for SAP" releases
- **Mandatory design review** and approval by SAP for all SAP relevant DB2 line items before implementation starts
- **Testing and verification** during the entire DB2 development cycle, far before the product goes GA
- **Near-concurrent GA**: SAP customers can benefit from the innovations immediately, typically within 6-8 weeks after IBM eGA



DB2 Database Partitioning Feature (DPF)

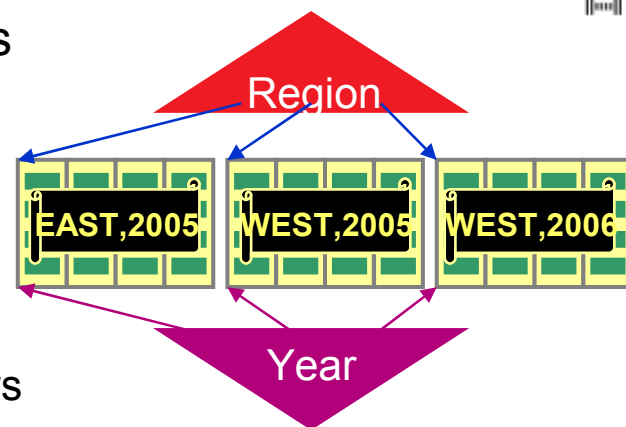
- Collection of “Partition” put together to form a single database
- Applications see a single database
 - Data loaded/inserted transparently hash-partitioned across partitions
 - SQL and utilities transparently parallelized across partitions



DB2 Multi Dimensional Clustering (MDC)



- MDC organizes table data along one or more columns defined as MDC dimensions
 - Records with the same values in one or more columns are stored physically together in blocks of pages. Blocks correspond to tablespace extents.
 - MDC block indexes point to blocks instead of single rows (block indexes are small)

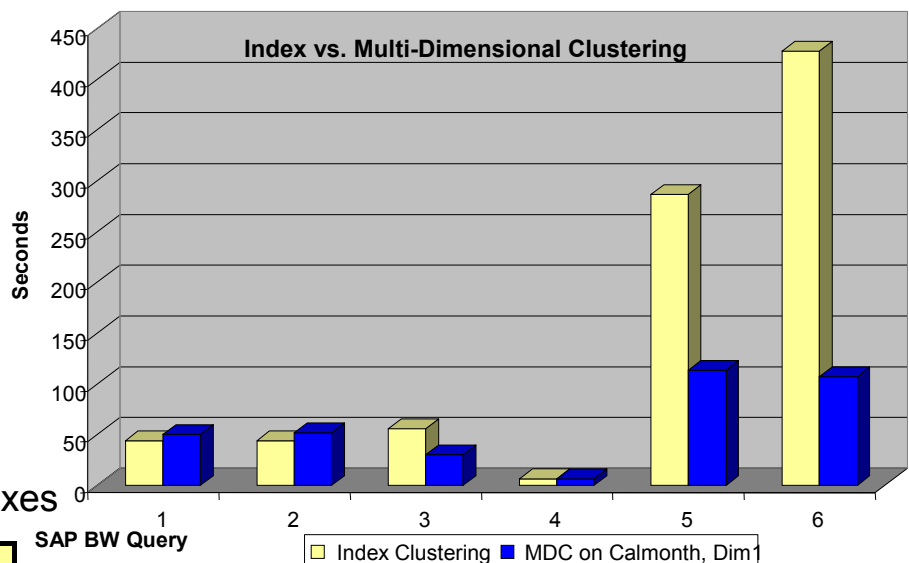


- Seamless integrated into SAP BW
 - MDC advisor is fully integrated into SAP DBA Cockpit
 - MDC is default on PSA and DSO tables

Benefits

- Faster query processing
 - Less blocks need to be read from disk
- Fast data deletion:
 - Whole extents can be dropped
 - Asynchronous cleanup of secondary indexes

| Without MDC | With MDC Rollout Deletion |
|-------------|---------------------------|
| 844 seconds | 15 seconds |



Query Restrictions match MDC Definition

- Fast and easy space reclaim

DB2 Features exploited by SAP BW



| DB2 for LUW Feature | Benefit |
|--|---|
| Database Partitioning (DPF) <ul style="list-style-type: none"> • Insert Buffering • Fast Communication Manager Improvement (DB2 V9.1) | Performance, Scalability |
| Multi-Dimensional Clustering (MDC) <ul style="list-style-type: none"> • MDC Rollout (DB2 V9.5) • Reclaim free space online (DB2 9.7) | Performance Less Maintenance |
| Row Compression (DB2 V9.1), Index Compression (DB2 9.7), Temp Space Compression (DB2 9.7) | TCO Reduction, Performance |
| SQL statement optimization and execution <ul style="list-style-type: none"> • Cost based SQL query optimizer • DB2_REDUCED_OPTIMIZATION • Star-Join with dynamic bitmaps, Hash Join, SQL Merge • Costing Improvements (Star-Join DB2 V9.1, DPF DB2 9.7) • Scan sharing (DB2 9.7) | Performance, TCO Reduction |
| Statistics Enhancements <ul style="list-style-type: none"> • Automatic Runstats • Real Time Statistics (DB2 V9.5) • Statistical views (DB2 V9.1) | Less Administration, Performance |
| Storage Optimization <ul style="list-style-type: none"> • Automatic Storage • Reclaimable Storage (DB2 V9.7) | Less Administration, Maintenance |
| Enhanced Monitoring (DB2 V9.7) | Monitoring |



SAP BW on DB2 DPF - Database Layout



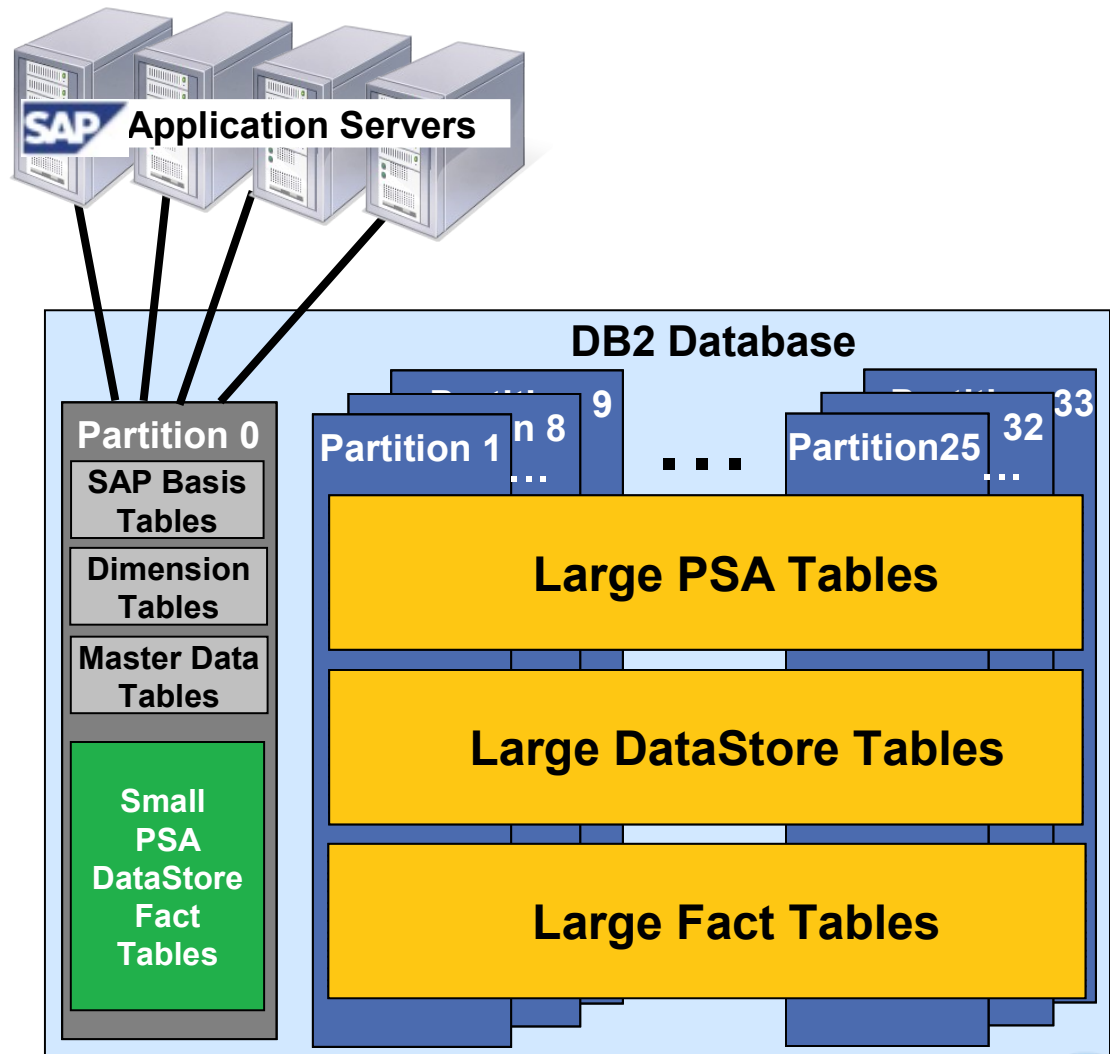
SAP BW application servers are connected to database partition 0

- Fast access to SAP basis, SAP BW master data and SAP BW dimension tables

Large SAP BW tables are distributed over several database partitions

- Partitioning keys are generated automatically
- Uniform data distribution

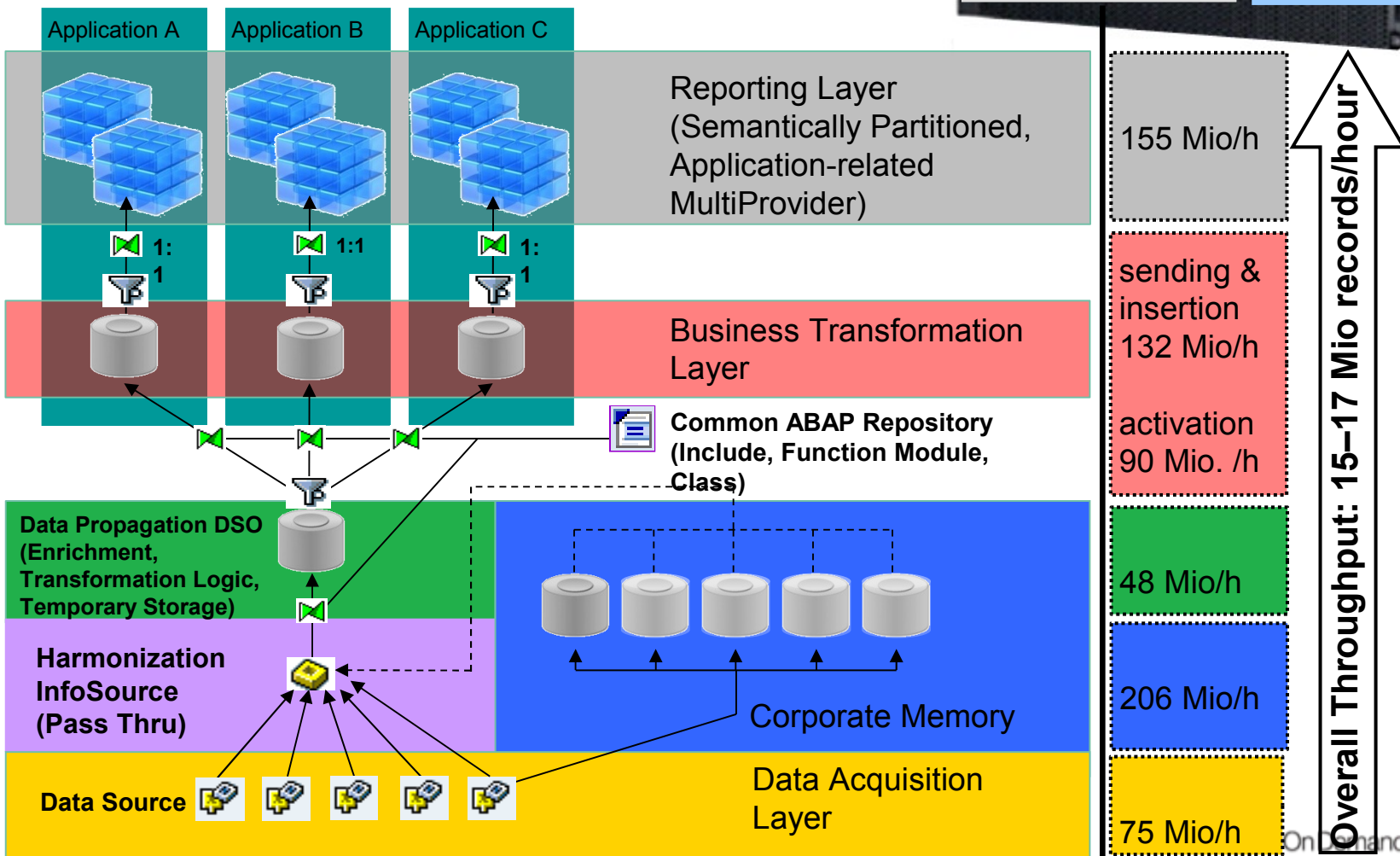
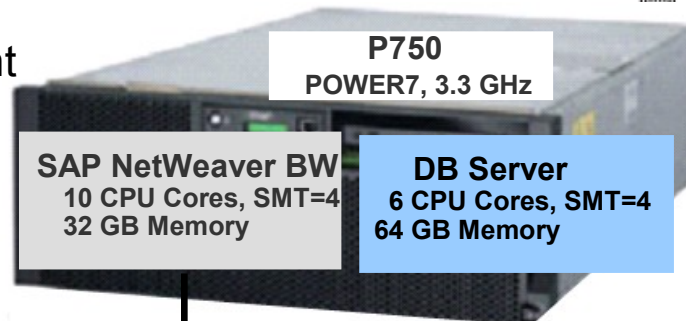
➔ Near linear scalability



SAP EDW for POS Data optimized for DB2 – PoC Results



- Load 2 years of POS data of a large retail company into SAP BW 7.3 through all layers of POS data management
- ~ 20 Billion records stored in the SAP BW InfoProviders
- DB2 Database has 8 database partitions
- Database size = 6.4 TByte (compressed)



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IBM Smart Analytics System



Foundation that leverages Green Technologies Real time, ready to go data warehousing solutions

IBM system of analytics software, server and storage hardware and services eliminates the time and cost of integrating and optimizing analytics solutions for business use, while preserving the flexibility not offered by single use appliances.



IBM

Smart Analytics System

IBM Smart Analytics Systems include **everything** required to serve as a foundation for your Analytics and Business Intelligence solutions. Some of the included highlights are:

- Proven Cognos / InfoSphere Warehouse / DB2 software
- Best of breed IBM hardware technology
 - Integrated SSD technology
- Comprehensive total solution support
- **Automated software / firmware maintenance**



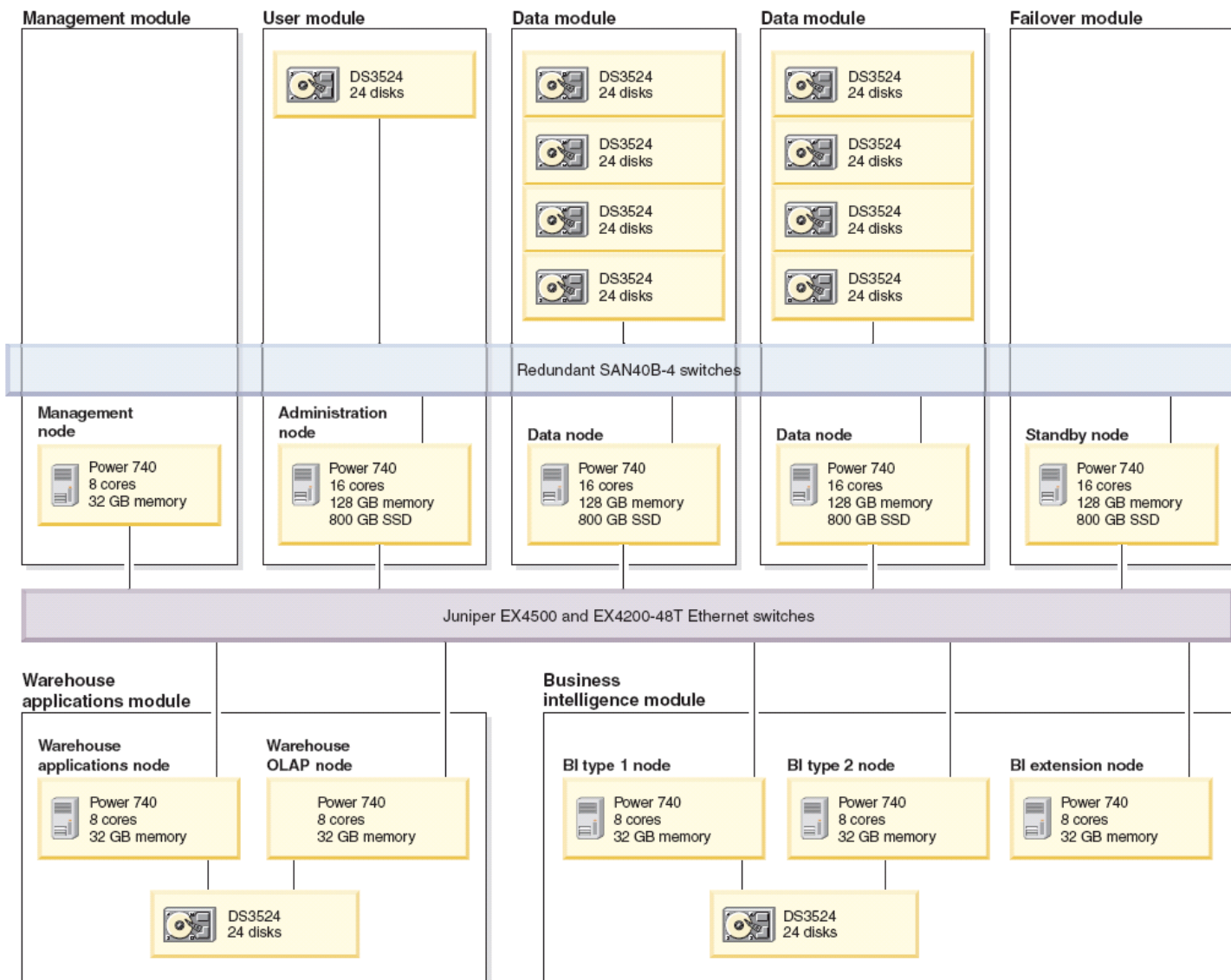
A Smarter Design



- **Balanced performance.** The components that make up the Smart Analytics System have been chosen for their performance characteristics, and balanced with the other components in the design.
- **Stability.** Components have been chosen that are successfully in use in production environments today, and have undergone rigorous lab testing
- **Price/performance.** The price to performance ratio has been considered a design principle to ensure an attractive price-to-performance characteristic of the solution.
- **Scalability.** The scalability of the Smart Analytics System solution is addressed via scale-out of the server and storage. This scalability has been made as simple as possible with a modular design
- **Fault tolerance.** components have been chosen to provide fault tolerance, exploiting the built-in features of Power systems, network, SAN, and storage components
- **High availability.** High availability is provided at the server level through the hot-standby implementation and within the disks with a robust RAID design.
- **Ease of installation and implementation.** The Smart Analytics System design has been chosen to facilitate ease of installation, implementation, and manageability



IBM Smart Analytics System Configuration

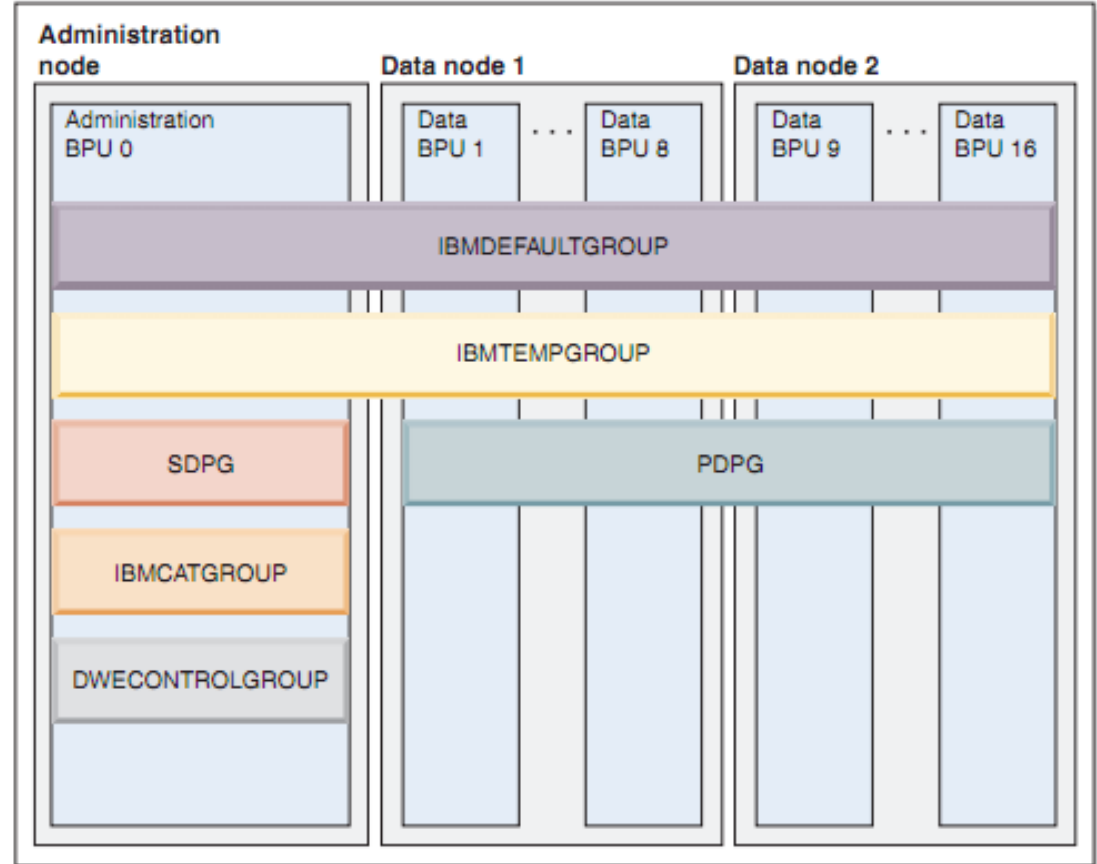


IBM Smart Analytics System 7700 Rack



DB2 Setup for Core Warehouse modules

- User module has 1 BPU (Balanced Partition Unit)
- Data modules have 8 BPUs
- Each data BPU gets:
 - 2 CPU cores
 - 16 GB memory
 - 12 HDDs
 - shared SSD
- Standard page size of 16kB, with 16 extentsize
- DB2 Automatic Storage
- Logging on separate disks
- Provision for optional mirrored logging



Maintenance: Service Strategy



IBM Smart Analytics System

Single source of support reduces complexity of managing the updates

Restricted access to component updates ensures stack remains certified.

Complete orchestration of updates across the system removes error prone steps and ordering requirements.



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Mapping SAP BW to IBM Smart Analytics System 7700 (1)

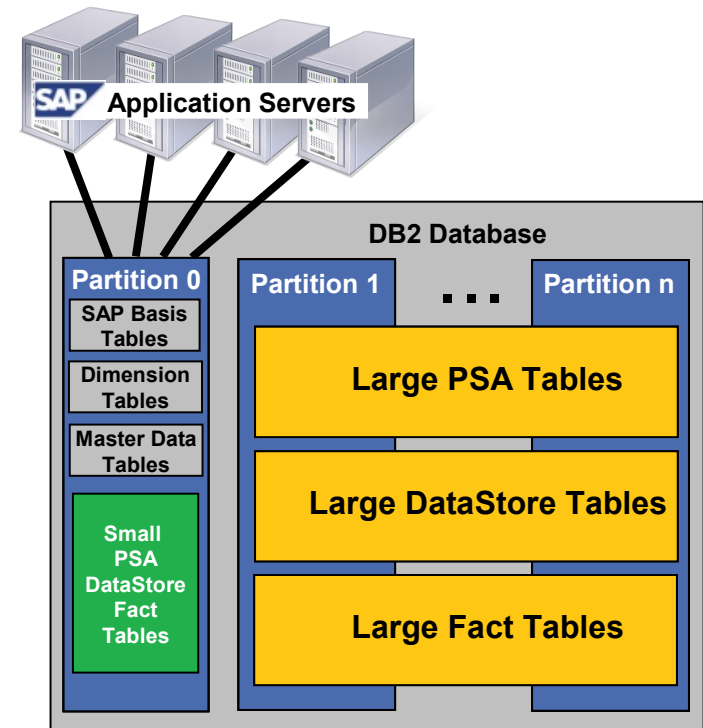


Differences between SAP BW and other Data Warehouse applications

- SAP BW application calls a large number of OLTP like queries accessing SAP basis and SAP BW meta data tables
- Very often record-based ETL processing
- More main memory required for database servers
- To achieve best SAP BW performance on DB2 DPF
 - All SAP BW application servers are connected to database partition 0
 - Large SAP BW tables are distributed on several database partitions
 - SAP basis tables and small SAP BW tables are stored on database partition 0

Customer Experiences

- **Database Partition 0**
 - 20% of database server resources
 - DB size: 3% – 7% of total DB size
- **Database Partition 1 .. N**
 - 80% of database server resources
 - DB size of all Data Modules:
93% - 97% of total DB size



Mapping SAP NetWeaver BI to ISAS 7700 (2)

Differences between SAP BW and other Data Warehouse applications

- SAP BW application calls a large number of OLTP like queries accessing SAP basis and SAP BW meta data tables
- Very often record-based ETL processing
- More main memory required for database servers
- To achieve best SAP BW performance on DB2 DPF
 - All SAP BW application servers are connected to database partition 0

→ All SAP BW application servers are connected to ONE User Module

Several database partitions are stored on database partition 0

Customer Experiences

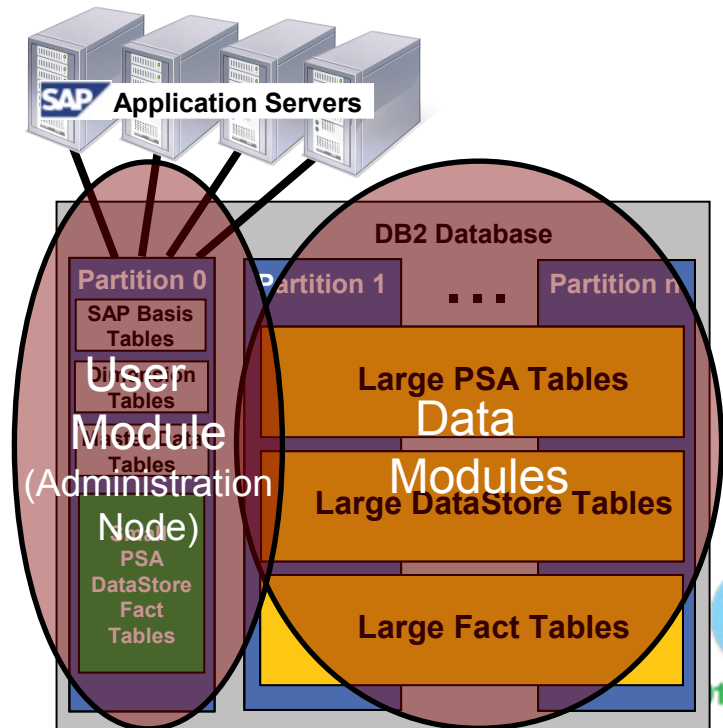
- **Database Partition 0**
 - 20% of database server resources

→ User Module needs 20% of total DB server resources

- **Database Partition 1 .. N**
 - 80% of database server resources

→ DB Partitions 1 .. N are assigned to Data Modules

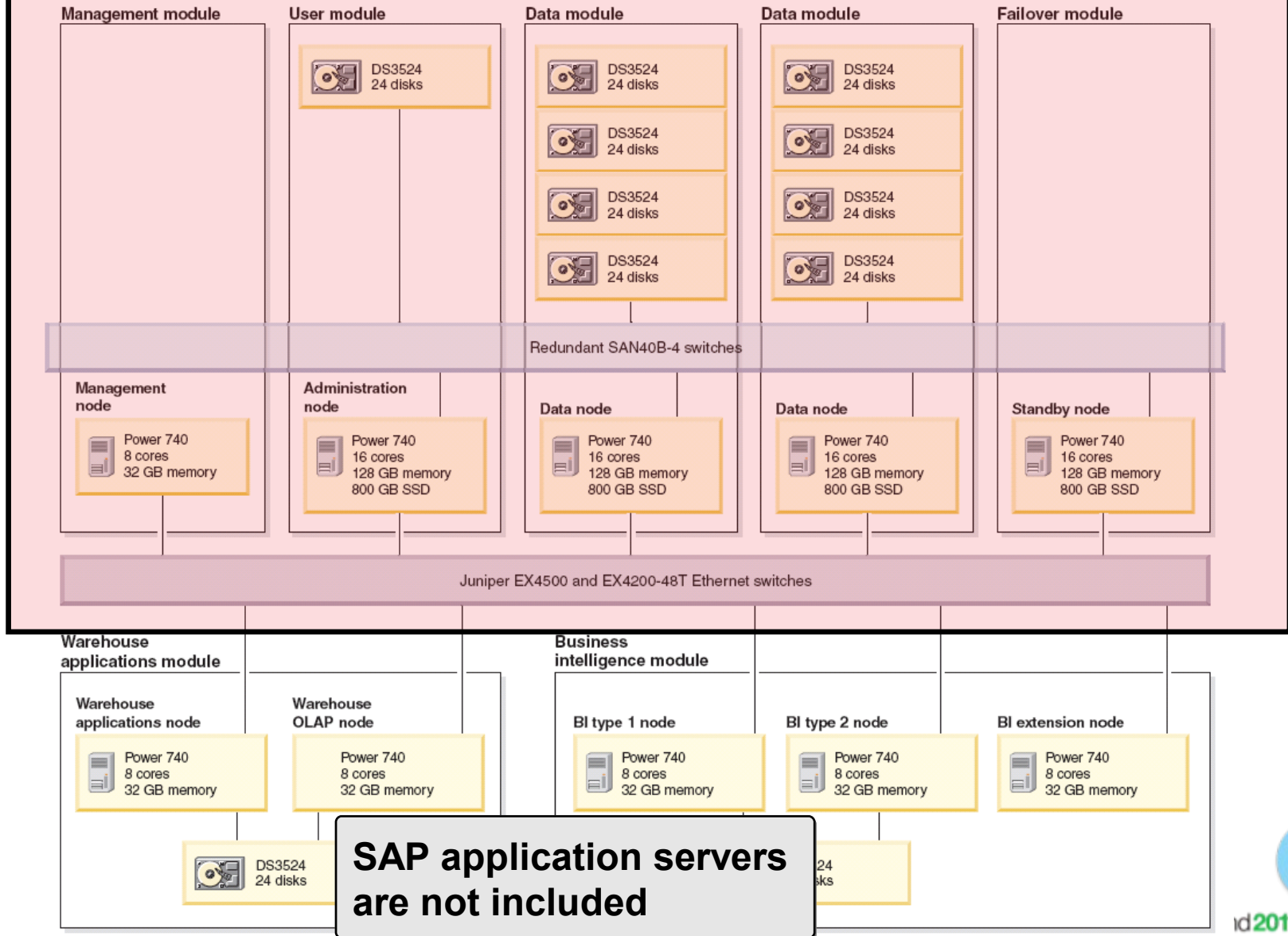
→ Data Modules need 80% of total DB server resources



Configuration Overview for 7700



Used IBM Smart Analytics System 7700 Modules for SAP BW



SAP BW Configuration Example

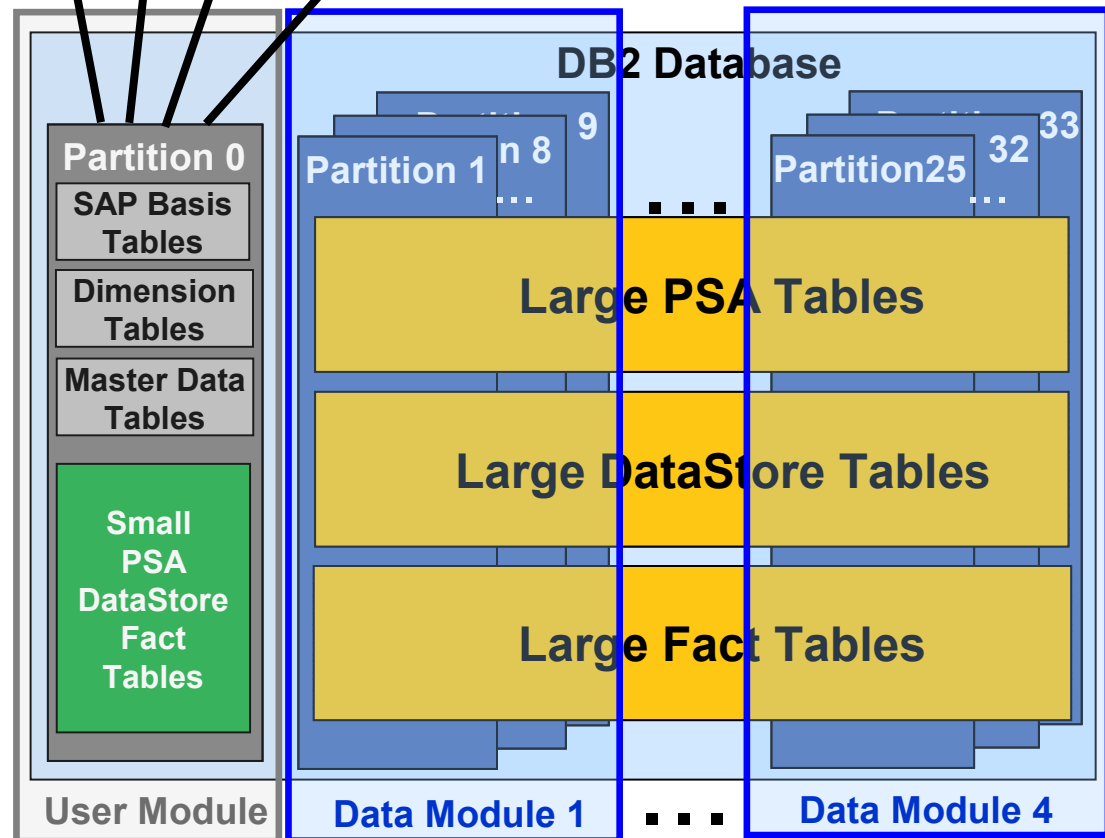


1 User Model

- Support of one User Model only for SAP BW
- User Modul has one Administration Node (= DB Partition 0)

4 Data Modules

- Each data module has 8 database partitions



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Delivery & Installation & Running & Support/Maintenance



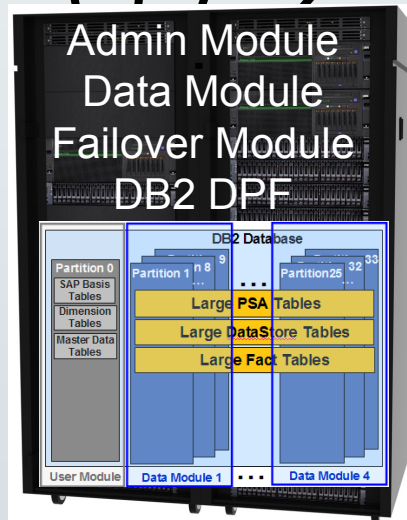
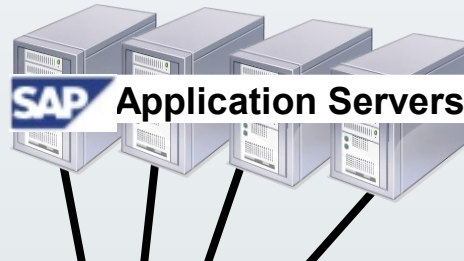
Delivery

- Pre-configured System
 - HW + OS
- DB2 installed
 - DB partitions configured
 - DB parameters tuned
- ➔ **Ready for SAP BW Installation**

Shipped to customer

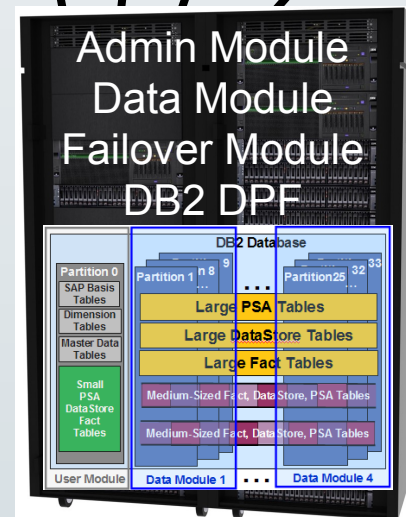
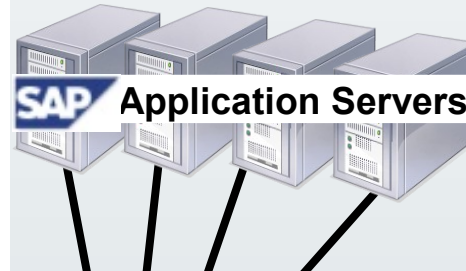
SAP BW Installation

- Standard SAP BW installation without DB2
- ➔ **Ready to run SAP BW**



SAP BW Running

- Customer specific SAP BW usage
- ➔ **Optimized for fast SAP BW query and ETL processing**



Support/Maintenance

- SAP-certified DB2 FixPacks
- SAP support
- ➔ **Integrated Process**

New FixPacks



Delivery & Installation & Running & Support/Maintenance



Delivery

- Pre-configured System
 - HW + OS
- DB2 installed
 - DB partitions configured
 - DB parameters tuned
- ➔ **Ready for SAP BW Installation**

SAP BW Installation

- Standard SAP BW installation without DB2
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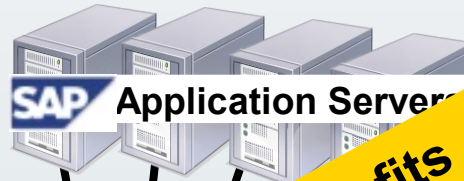
SAP BW Running

- Customer specific SAP BW usage
- ➔ **Optimized for fast SAP BW query and ETL processes**

Support/Maintenance

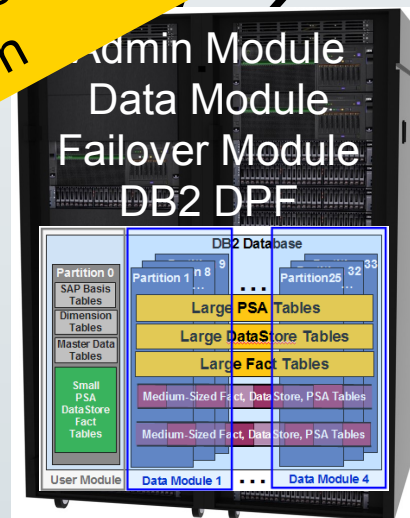
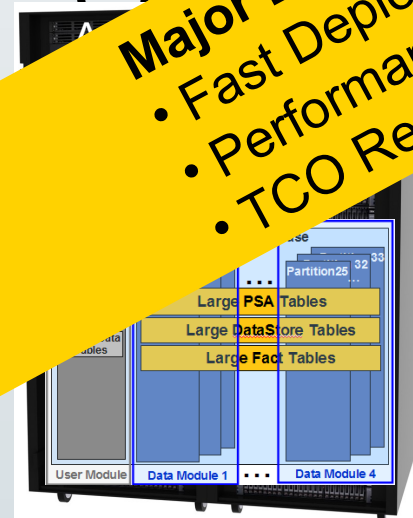
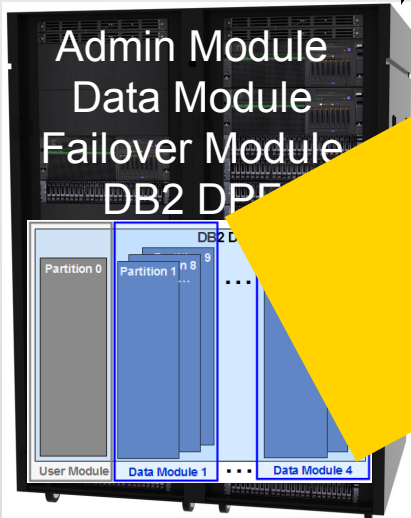
- SAP-certified DB2 FixPacks
- SAP support
- ➔ **Integrated Process**

Shipped to customer



Major Benefits

- Fast Deployment
- Performance Benefits
- TCO Reduction



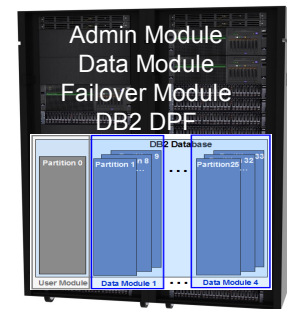
New FixPacks



Delivery of IBM Smart Analytics System 7700 for SAP BW



- SAP NetWeaver BW 7.0 Unicode systems and higher releases are supported
- Ordering IBM Smart Analytics 7700
 - Choose the SAP BW deployment option
 - Choose other deployment options, e.g. high availability option
- HW Set-Up: IBM Power 740 servers & IBM Storage DS3542s
 - One User Module with Admin Node and Management Node
 - Number of Data Modules depends on system sizing
 - Optional: Failover Modules
- AIX 6.1
 - SAP BW specific groups and users
 - SAP BW specific file systems
 - Java JRE required for SAP is installed in /usr/jre142_64
- DB2 9.7
 - Database name = <SAPSID>
 - Configured with multiple database partitions
 - SAP BW specific DB2 parameter setting
 - Optional: High availability with IBM Tivoli SA MP



➔ **Shipped to customer**

➔ **Ready for SAP BW installation**



SAP BW Installation

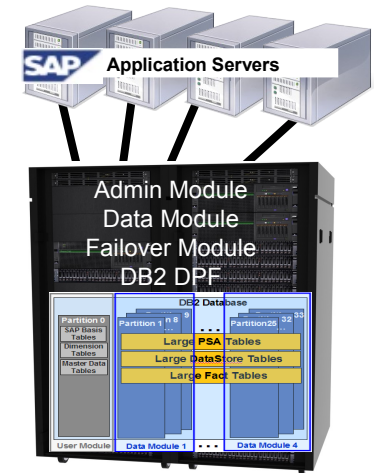


Standard SAP BW installation following the SAP installation documentation

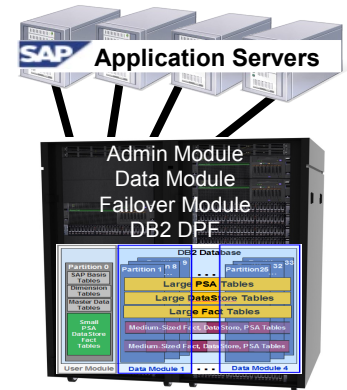
- Detailed description in SAP Note 1607235
- SAP DB Instance installation on the User Module
- Installation of SAP Central Instance and other SAP Installation on SAP application servers
- Activated DB2 features
 - DB2 data compression
 - DB2 MDC
- Standard SAP BW specific database partition groups
- Standard SAP BW specific DB2 tablespaces

➔ **Simplified SAP BW Installation Process**

➔ **Optimized to Run SAP BW on DB2**



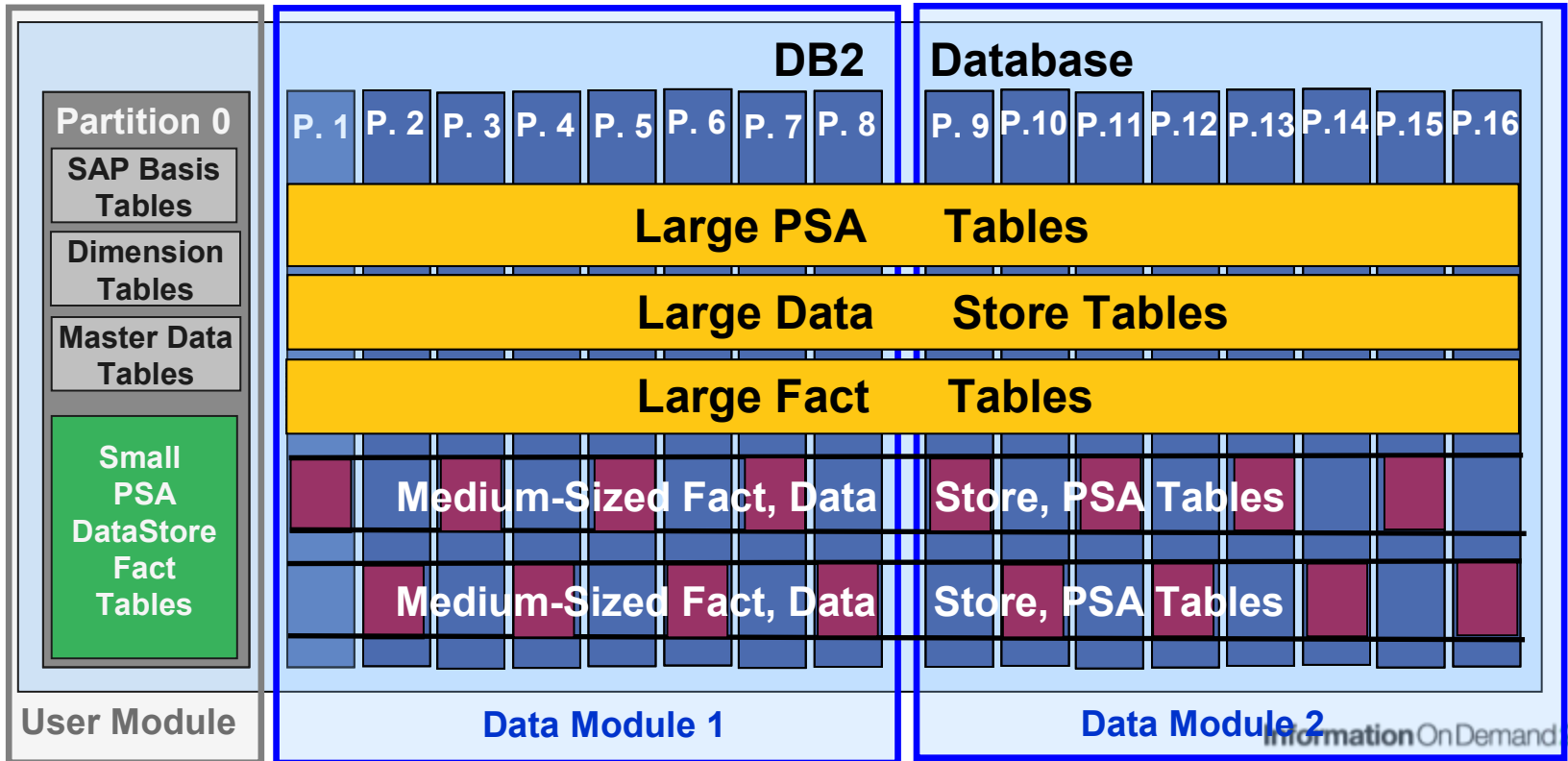
SAP BW Running – Simplified Table Layout



- Customer specific SAP BW usage
- Goal: Workload distribution over all modules
- “Rule of Thumb”

| Table size | Table Distribution |
|------------------------|---|
| < 4 Million records | on Partition 0 |
| 4 - 32 Million records | on 8 partitions, evenly distributed on the data modules |
| > 32 Million records | on all DB Partitions |

- Example with 2 Data Modules



Maintenance / Support

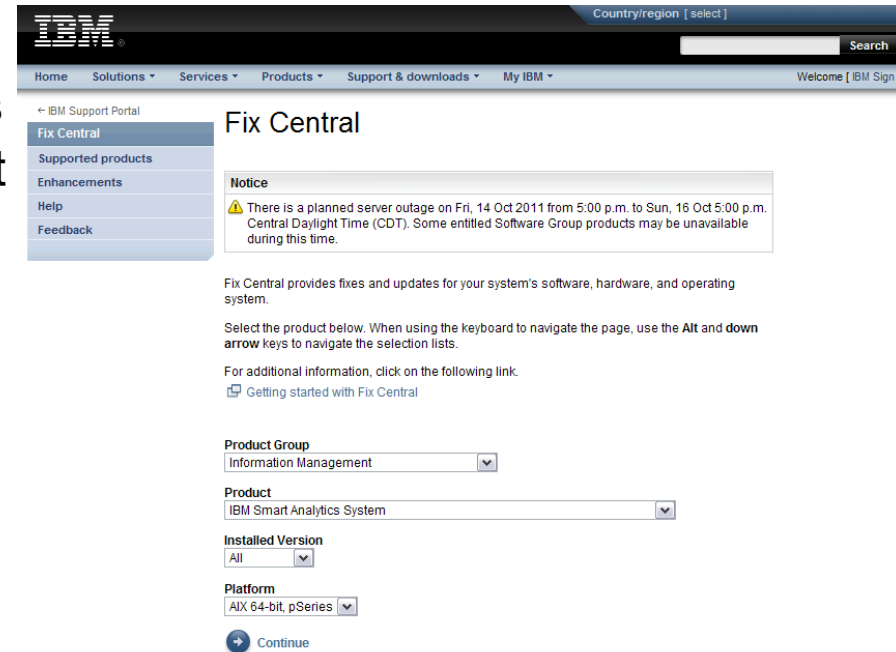


- Maintenance

- DB2 Fix Packs for the IBM Smart Analytics System 7700 are build on the SAP certified Fix Packs (listed in SAP Note 101809)
- FixPack Download is available at <http://www.ibm.com/support/fixcentral/>

- Support

- SAP related or DB2 related problems
 - ➔ Covered by standard SAP support
 - If needed, SAP and IBM provides instructions where to find special DB2 builds
- Other problems, e.g. HW, OS related
 - ➔ Covered by standard IBM Smart Analytics System support
- SAP and IBM support are working close together to solve indefinite customer problems related to both areas



➔ Well Integrated Maintenance / Support process



IBM Smart Analytics System 7700 - Advantages used for SAP BW



| | |
|--|--|
| | IBM Smart Analytics System 7700 (used for SAP BW / not used for SAP BW) |
| Quality Assurance | Periodic evaluated HW and SW stack - System tests - Performance evaluation |
| System Administration, Monitoring | System Management Module DB2 Performance Expert |
| Installation & Configuration | DB2 installed Other SW components installed |
| High Availability | Failover Modules (optional) |
| DB2 Features | Database Partitioning (DPF) Multi-Dimensional Clustering (MDC) Compression Automatic Runstats Workload Management Table Partitioning Materialized Query Tables (MQT) |
| Software Stack | AIX 6.1 GPFS 3.3 InfoSphere Warehouse Enterprise 9.7 incl. DB2 ESE 9.7 DB2 Performance Expert 3.2 Tivoli System Automation (TSA) 3.1 Java SDK 1.6 DS Storage Manager 2.6 |
| Hardware Stack | IBM Power 740 IBM Storage DS3524 Built-in HW redundancies, e.g. power supply, switches |



IBM Smart Analytics System 7700 - Advantages used for SAP BW



| | IBM Smart Analytics System 7700 (used for SAP BW / not used for SAP BW) |
|-----------------------------------|--|
| Quality Assurance | Periodic evaluated HW and SW stack - System tests - Performance evaluation |
| System Administration, Monitoring | System Management Module DB2 Performance Expert |
| Installation & Configuration | DB2 installed Other SW components installed |
| High Availability | Failover Modules (optional) |
| DB2 Features | Database Partitioning Multi-Dimensional Compression Automated Workload Management |
| Software Stack | SAP Business Warehouse Enterprise 9.7 incl. DB2 ESE 9.7 DB2 Performance Expert 3.2 System Automation (TSA) 3.1 Java SDK 1.6 DS Storage Manager 2.6 |
| Hardware | IBM Power 740 IBM Storage DS3524 Built-in HW redundancies, e.g. power supply, switches |

IBM Smart Analytics System 7700 is well suited for SAP BW



Agenda

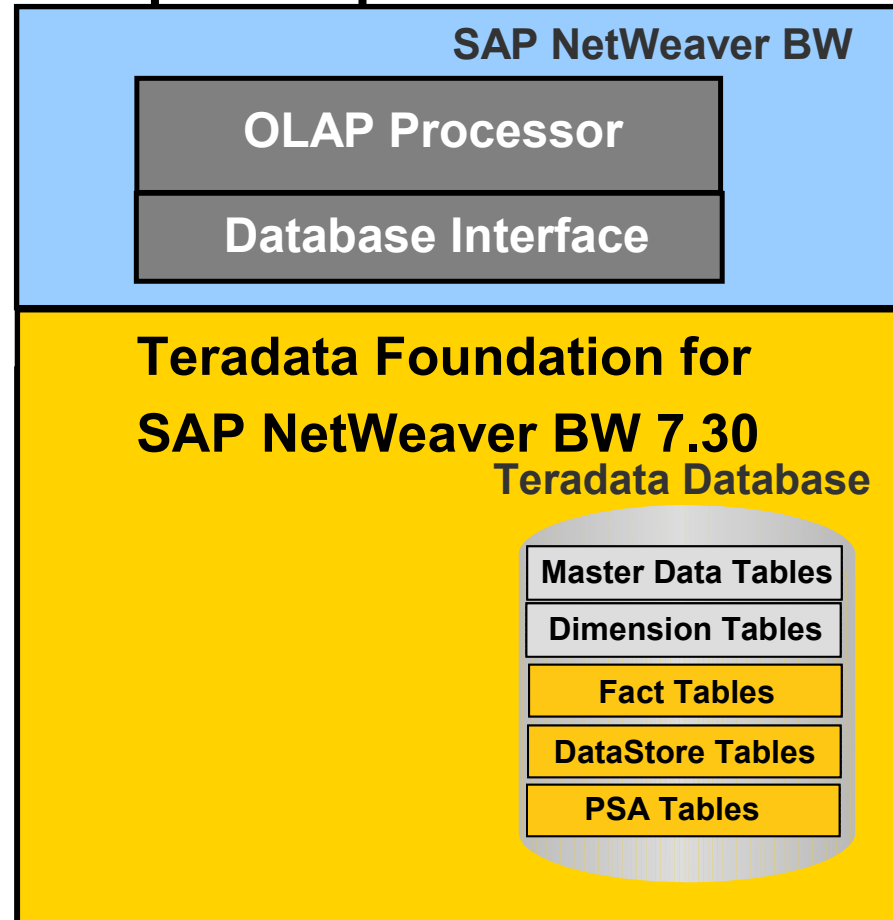
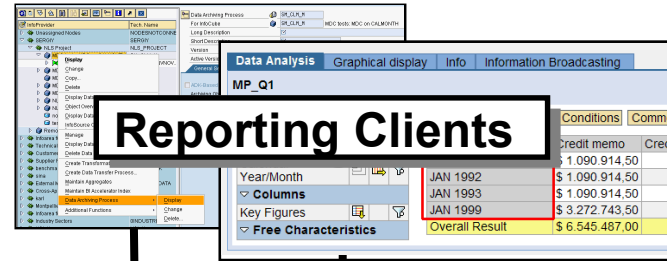


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Teradata Foundation for SAP NetWeaver BW 7.30

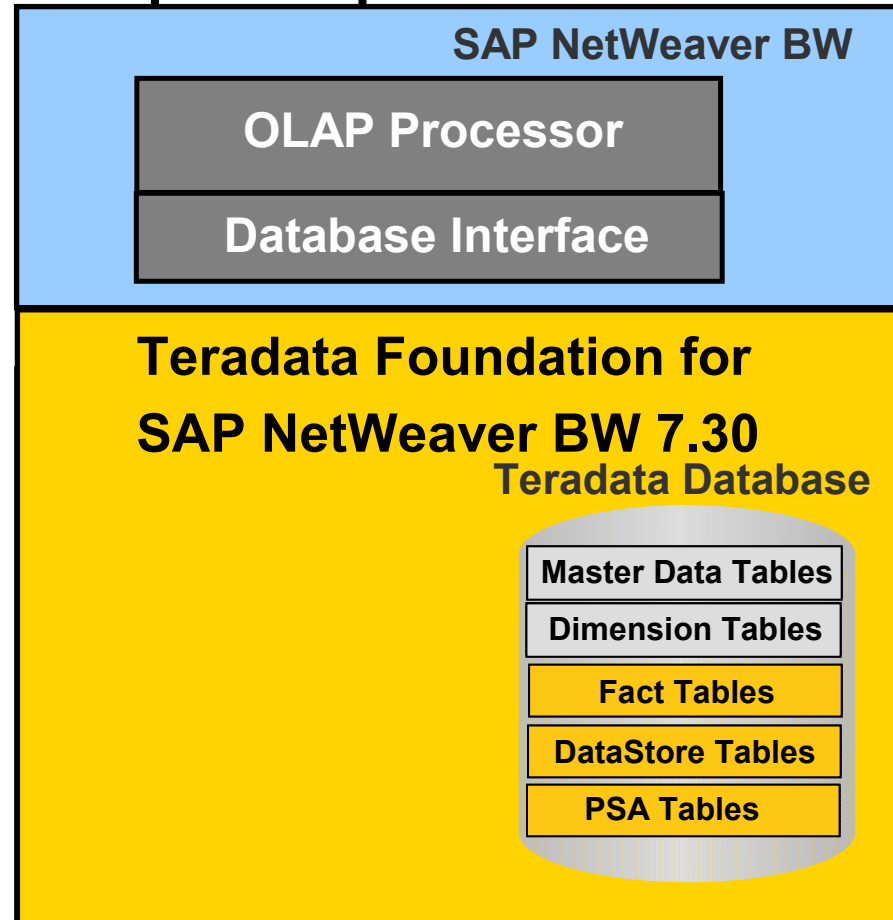
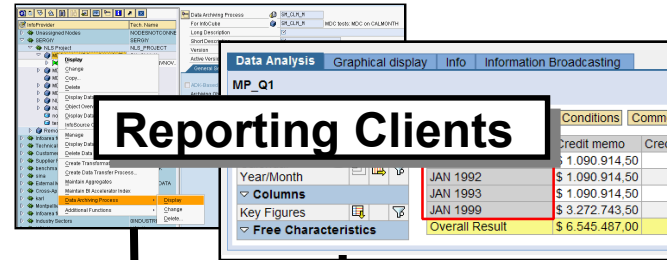
- **SAP NetWeaver BW supports Teradata as a database for storing master data and transaction data**
- **Available with SAP NetWeaver 7.3**



Teradata Foundation for SAP NetWeaver BW 7.30



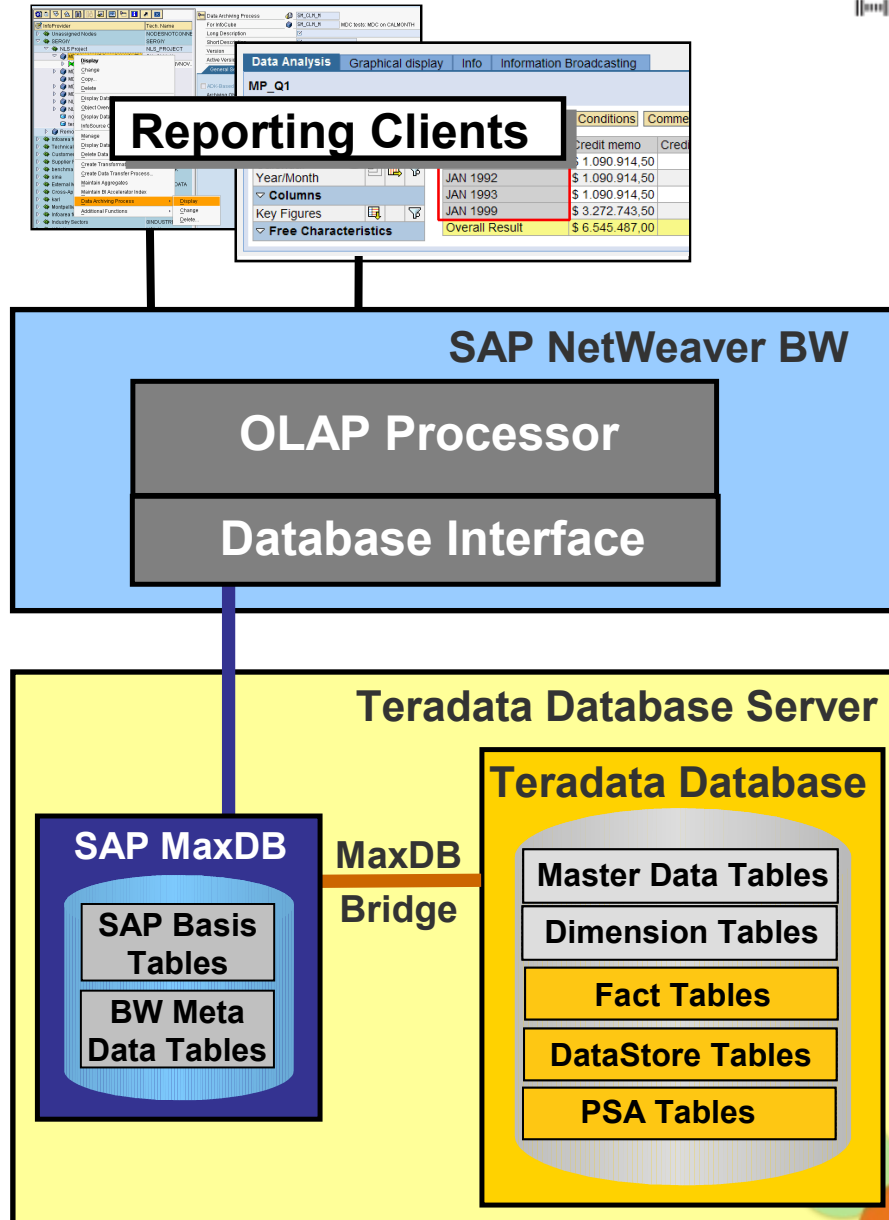
What is the Teradata Foundation for SAP BW 7.3?



Teradata Foundation for SAP NetWeaver BW 7.3

What is the Teradata Foundation for SAP BW 7.3?

- Two Databases
 - SAP MaxDB for
 - SAP Basis Tables
 - SAP BW Meta Data Tables
 - Teradata
 - SAP BW Master Data Tables
 - InfoCube Dimension Tables
 - InfoCube Fact Tables
 - DataStore Tables
 - PSA Tabela
 - Two step data access
 - SAP BW communicates with MaxDB via SQL Interface
 - Data access on Teradata via SAP MaxDB Bridge
- ➔ **Data persistency in two databases (instead of one) generates significant overhead**



Comparison SAP BW on ISAS 7700 versus Teradata Foundation for SAP BW 7.3



| | SAP BW on ISAS 7700 | Teradata Foundation for SAP BW |
|--|---|--|
| Joint platform development team at SAP partner | YES | NO |
| Database Technology used for productive SAP systems | YES | NO |
| Common SAP / Database Roadmap | YES | ? |
| Is the database support strategy aligned with SAP's support strategy (7 + 2) | YES | NO |
| Available with SAP BW 7.0 | YES | NO |
| Database complexity | LOW One Database Management System = DB2 | HIGH Two Database Management Systems - SAP MaxDB - Teradata |
| Data consistency | SIMPLE within one database | COMPLEX over two databases |
| Backup / Recovery | SIMPLE DB2 built-in function | More COMPLEX two databases are involved |



Comparison SAP BW on ISAS 7700 versus Teradata Foundation for SAP BW 7.3



| | SAP BW on ISAS 7700 | Teradata Foundation for SAP BW |
|--|--|--|
| SAP BW query performance | EXCELLENT Parallel query processing (DPF) | EXCELLENT - Parallel query processing - Additional data copy due to MaxDB Bridge |
| Support of SAP BW 7.3 Massive Parallel Processing | YES | YES |
| ETL Performance Source → PSA PSA → DataStore PSA → InfoCube DataStore → InfoCube | EXCELLENT Optimized for parallel processing with DB2 DPF since 1999 | ? Additional data copy due to MaxDB Bridge |
| SAP Integration | HIGHLY INTEGRATED DB2 optimized for SAP since 2005 - SAP BW Installation - SAP Solution Manager - Monitoring: SAP DBA Cockpit - High Availability - DB2 specific Near-Line Storage - others | LESS INTEGRATION |
| Optimizations for SAP | HIGHLY OPTIMIZED Many DB2 features are optimized for SAP: Compression, DPF, MDC, Automatic Storage, DB2 Optimizer, Automatic Runstats, ... | ? |

Agenda



- Overview SAP NetWeaver BW on IBM DB2 for LUW
 - Overview IBM Smart Analytics System 7700
 - SAP NetWeaver BW on IBM Smart Analytics System 7700
 - SAP NetWeaver BW Deployment
 - SAP NetWeaver BW on IBM Smart Analytics System 7700
versus SAP NetWeaver BW on Teradata
- Summary



Summary

- DB2 is optimized for SAP
 - Integrated SAP BW on IBM Smart Analytics System 7700 solution with major benefits
 - Integrated solution
 - Ease of installation and administration
 - Balanced performance
 - Stability
 - Scalability
 - Built-in High Availability
- ➔ Saves your investment
- ➔ Reduces Support & Maintenance effort
- ➔ Reduces Total Cost of Ownership



Communities

- **On-line communities, User Groups, Technical Forums, Blogs, Social networks, and more**
 - Find the community that interests you...
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 - **Business Analytics** ibm.com/software/analytics/community
 - **Enterprise Content Management** ibm.com/software/data/content-management/usernet.html
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 - ibm.com/champion

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