Performance in SAP BW

Lori Vanourek
Product Management SAP NetWeaver / BI

Mike Eacrett
SAP NetWeaver RIG - BI
Overview

- Query Performance
  - Aggregates
  - OLAP Cache
  - Pre-Calculation

- Data Load Performance
Performance Tuning

- **OLTP Systems**
  - Application Development and performance tuning separated
  - Performance tuning by basis experts

- **SAP BW**
  - Performance Tuning as holistic process over application design and database configuration
  - **Performance is designed into an SAP BW solution!!!**
General Performance Rules

Basic rules for performance optimization:

Be economic: Eliminate all unnecessary processes

Keep it small: Reduce the data volume to be processed

Do it parallel: Deploy parallelism on all available levels

Parallel processes are fully scalable
Data Modeling Checklist

SAP BW Layers
  Operational Store
  Data Warehouse Layer
  Multidimensional Model

Dimensions of InfoCubes
  Line Item Dimensions

Logical (MultiProvider) Partitioning

Time-Dependent Master Data

Non-Cumulative Key Figures

Compression
Strategically use of Data Warehouse layers

It is important to use the right objects into your DW model...

- ODS Objects and InfoCubes are specifically designed for certain roles!
- Overview of the EDW layers...

- **Operational Data Store**
  - Operational Reporting
  - Near Real-Time / Volatile
  - Granular
  - Built with ODS Objects

- **Multidimensional Models**
  - Multidimensional analysis
  - Aggregated view
  - Integrated
  - Built with InfoCubes

- **Persistent Storage Area**
  - Data Staging
  - Raw data
  - Built with PSA objects

- **Data Warehouse**
  - Non-volatile
  - Granular
  - Integrated
  - Historical foundation
  - Built with ODS Objects

- **Operational Data Store**
  - Operational Reporting
  - Near Real-Time / Volatile
  - Granular
  - Built with ODS Objects

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Checklist – Query and Web Performance – Overview

Which component contributes most?

Database
1. Data Model
2. Query Definition
3. Aggregates
4. OLAP Cache
5. Pre-Calculated Web Templates
6. Compressing
7. Indices
8. DB Statistics
9. DB and basis (Buffer) Parameter

OLAP
1. Data Model
2. Query Definition (including OLAP features)
3. Aggregates
4. OLAP Cache
5. Virtual Key Figures / Characteristics
6. Authorizations

Frontend
1. Network
2. WAN and BEx
3. Client Hardware
4. VBA / Java
5. Documents
6. Formatting
7. ODBO / 3rd party

Tools
SQL Trace (ST05)
RSRV
RSRT, RSRTRACE

RSRT, RSRTRACE
SQL Trace (ST05)
ABAP Trace (SE30)

IEMON
RSRT, RSRTRACE
OLAP Performance Layers

- Portal iView Cache
- Pre-Calculation / Offline Analysis
- OLAP Cache
- Aggregates
- InfoCubes
- Reuse
- Performance
Aggregates

Definition

- Materialization of aggregated subsets of InfoCube fact table data
- Independent structures where summary data is stored within separate, transparent InfoCubes

Benefits

- Transparency: Users do not notice if aggregate is hit or not
- Improved query performance by reducing the amount of data to be read from DB

Aggregates can be created ...

- Only on top of basic InfoCubes
- For dimension characteristics
- For navigational attributes
- On hierarchy levels
- Using time-dependent navigational attributes (as of SAP BW 3.x)
- Using hierarchy levels where the structure is time-dependent (as of SAP BW 3.x)

Note: Aggregates can improve query performance considerably, but keep in mind that they also impact the load performance.
Global OLAP Cache in SAP BW 3.x

- Session- and user-independent
- Stores Query Results
  - In application buffer
  - In cluster table or flat file (highly compressed)
- Benefit
  - Complete query results with virtually no DB table access as of the second call of the query
- Re-use
  - For equal queries or subsets of cached query results
- Invalidation
  - OLAP Cache and actual InfoProvider data always in-sync
  - Invalidation of cache entries e.g. after transaction data load, master data load/change run, meta data change
- Strategy
  - Warm-up OLAP Cache via reporting agent/Information Broadcasting
Contents

Overview

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Data Load Performance
Checklist – Data Load Performance – Overview 1 –

**Which component contributes most?**

- Extraction
- Transfer
- Load Into PSA

1. Customer Exits
2. Resource Utilization
3. Load Balancing
4. Data Package Size
5. Indices on tables
6. Flat File format
7. Content vs. generic extractor

1. Resource Constraint
2. CPU / Memory Bottleneck
3. Network
4. Application Buffer Synchronization

1. I/O Contention
2. PSA Partition Size

**Tools**

Extractor Checker (RSA3),
ABAP Trace (SE30),
SQL Trace (ST05)

SM50
SQL Trace (ST05)
OS Monitor (ST06)

OS Monitor (ST06)
DB Monitor (ST04)
Checklist – Data Load Performance – Overview 2 –

Which component contributes most?

1. Transfer Rules / ABAP Coding
2. Transformation Library Formulas

Check these points:

1. Transformation Rules / ABAP Coding
2. Transformation Library Formulas

Load Into Data Targets

1. Roll-up
2. Change Run
3. Compression
4. Indices
5. Load Master Data before Transaction Data
6. Buffering Number Ranges

ODS Objects

1. Parallel ODS activation
2. Unique Data Records
3. Flag BEx Reporting
4. Indices

Technical Content, Data Load Monitor

1. Buffering Number Ranges
2. Change Run

Update Rules

Transfer Rules

Debugger within Monitor

ABAP Trace (SE30), SQL Trace (ST05)

Tools

SQL Trace (ST05)
Summary

Design your Data Model Prudently and Consider Regular Reviews

Compress Regularly

Use Aggregates and Design Them Carefully

Use customer-oriented reporting & analysis features
Further Information

How-To Papers

http://service.sap.com/BW (Alias 'BW') > Services and Implementation

SAP Service Marketplace:

Use ALIAS: “BW” at

http://service.sap.com/BW

See Performance Folder

SAP BW Online Documentation

http://help.sap.com
Questions?

Q&A