Know-How Network: Effective SAP BW System Management

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Agenda

Overview

Process Chains
- Key Concepts
- Implementation

System Monitoring

Data Management

Capacity Planning

Summary
Learning Objectives

As a result of this workshop, you will be able to:

- Understand key concepts of BW system management
- Develop enhanced strategies for effective BW system management
- Incorporate best practices into BW system management procedures
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Summary
Collaborative efforts: technical and functional team members

Exploit all advantages of process chains: automate all key system activities

Proactive monitoring: Utilize the available tools to their potential, optimize accordingly

Data management: Consistently delete temporary data, summarize, consolidate and reduce data volume; minimize object sizes

Plan for growth: Sound capacity planning ensures system sizing and resource allocation is commensurate with user load and data volume growth rates

Service excellence: Vigilance in providing strong and performant SAP BW production environment AND attentively support ongoing development phases, ensuring quality via change management process
Ongoing Maintenance and Optimization Efforts

Monitoring and System Management

Tactical Tuning
- Resource Allocation
- Track Concerns
- Manage Data Volume

Evaluation
- Identify Bottlenecks
- Coordinate Effort
- Scheduling

Performance Tuning and Optimization
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Summary
Process Chains Motivation & Key Functionality

Automation of key SAP BW operational activities: data load and other tasks (ie compression, aggregate rollup, reporting agent)

These activities may require a significant administrator effort, without using process chains, risks include:
- Inefficient utilization of BW and basis teams’ time
- Possibility of missed activities, human error
- Limited monitoring capabilities

Some Important Process Chains Features:

- **Graphical modelling:** build a control flow of tasks to be executed in a defined sequence
- **Central monitoring of SAP BW operational activities**
- **Ability to Create and implement a custom process type:** powerful!
- **Openness:** Interface for Job Scheduling for SAP BW (Integration scenario to process chains for certified partners)
Process Chains Concepts: Typical Data Load Cycle

Other Monitors

- Start
- Load Master Data
- Data Mining Jobs
- Reporting Agent Jobs
- Change Run (MD activation)

Data Load Monitor

- Data loaded into ODS Object
- Activate ODS Object data
- Data loaded into InfoCube
- Roll up Aggregates
- Activate ODS Object data
- Data loaded into InfoCube
- Roll up Aggregates
- Change Run (MD activation)
Concept Example: Building a process control flow

Start

Load Master Data

Failure Success

Email System Admin

Activate Master Data

Failure Success

Perform change run (master data activation)

Email System Admin

IC Data Load 1 IC Data Load 2 IC Data Load 3

Failure Success off all 3?

Email System Admin

Rollup Aggregates

Email System Admin

Load 3 InfoPackages concurrently into 1 InfoCube

Failure
Process Chains Graphical Modeling and Monitoring

SAP delivers many process types!
Process Chains: Log View (aka Monitoring View) - RSPC

- Processes in Green show a successful completion.
- Processes in Red indicate a failure.
- Processes in Grey have yet to be executed.

Note: CCMS has an overview of process chain successes and failures.
Certified scheduling/monitoring tools offering integration with process chains:

- BMC (Control-M)
- CA (Unicenter job mgmt adapter)
- TIDAL (Enterprise Scheduler)
- UC4 (UC4 Global)
- ORSYP (Dollar Universe)
- Redwood (Europe) (Cronacle)
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Summary
Project planning and project organization

Project planning

- Process chains should be designed after modelling data flows but during the realization phase.
- Use the final preparation phase of your project to test your process chains for performance, correctness and robustness.

Project organization

- Team members must be able to use process chains, but also need knowledge about:
  - Data warehouse administration
  - Single process types used in process chains
- If several project teams build process chains in the same system, a central documentation process is critical.
How to start – process overview

Collect all processes that have to run before data can be released to end user
- Data Loading processes
- Administration processes
- Reporting Agent processes

Define time windows for process chains
- Requirements on data availability from business
- Contact basis administration team for information on jobs in source systems that have to run before data loading

Define dependencies and priorities
- Define whether one or several predecessors processes have to run before a single process can start
- Define whether a single process has to run when the process chain is executed or whether failures can be (temporarily) accepted
## Example on process overview

Collect all relevant processes in a central document to prepare modelling of process chains

<table>
<thead>
<tr>
<th>Object name (Variant)</th>
<th>Process type</th>
<th>Only for LOADING processes</th>
<th>Scenario</th>
<th>Frequency</th>
<th>Assigned process chain</th>
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<td>MR</td>
<td>ZIT_MDMO</td>
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<td>TRAN</td>
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<td>SP</td>
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<td>BWP</td>
<td>IMR</td>
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### possible additional fields:

<table>
<thead>
<tr>
<th>Mandatory</th>
<th>Predecessor</th>
<th>Job name</th>
<th>Responsible</th>
</tr>
</thead>
</table>

* Not always necessary, sometimes needed as of different time zones or different source data availability in one source system
Aspects of using process chain hierarchies

Complexity of a single chain (number of processes) should be reasonable

- “One process chain for everything” approach could create (unwanted) cross dependencies between processes

- Benefits on using process chain hierarchies (sub chains)
  - Better visualization of dependencies
  - Enhanced administration capabilities (e.g. Restarting of single sub chain)

- Maximum number of process chain hierarchy levels: 2 – 3 (recommendation)
Common SAP BW Tasks: Process Chain Automation

**Strongly Recommended**
- Data Load (all kinds)
- ODS Object Activation
- Aggregate Rollup
- InfoCube Compression
- DB statistics (RDBMS dependent)
- Change Run
- PSA Deletion

**Highly Recommended**
- Reporting Agent: OLAP Cache
- Reporting Agent: Pre-calculated Templates
- Reporting Agent: Exceptions & Conditions
- Master Data Reorganization
- Local Process Chain

Other tasks, such as export of data via Open Hub, should be utilized as needed.
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Summary
**Some Important Monitoring Tools**

**Scenario**
- Generally slow query or data load performance (systemic)
- Look for CPU utilization bottlenecks
- If adequate CPU time is available, check other factors

**What can you check?**
- Operating system (ST06)
- Database Information (DB02)
- Database monitor (ST04)
- Analysis of BW objects (RSRV)
- Performance Analysis (ST03, BW Statistic Business Content)
- Computer Center Management System (BWCCMS)
- Memory Management (ST02)
Monitoring Tools: Operating System Monitor (ST06)

Useful Key Figures

- Current Values (snapshots) and history (previous hours)
  - CPU
  - Memory
  - Swap

Check following parameter values:

- CPU utilization
- Free memory
- Also check SM50 for process bottlenecks
Monitoring Tools: Database Monitor (DB02)

Utilization

General DB Monitor
Check for missing indices

Useful Features

- Missing indices
- Table and Index extent growth (non-local tablespaces, RDBMS dependent)
- Monitor tablespace allocation
Tools: Analysis and Repair of BW Objects (RSRV)

Utilization
Many various analyses of InfoCubes and master data

Useful Features
- Database
  - DB statistics for an InfoCube and its aggregates
  - DB indices for an InfoCube and its aggregates
  - DB parameter settings check
  - DB Information about InfoProvider tables
    - InfoCube: Relative size of dimension tables compared to fact table
- "Repair" feature

Check following parameter values:
- Ensure DB statistics are up-to-date for an InfoCube
- Ensure indices exist for InfoCube
- Check for unbalanced InfoCubes
  - (dimension table size 10% or more compared to fact table size)
Tip: Build a monitoring cockpit using BW statistics content, custom query and BW web applications
Monitoring Tools: ST03 - Drill Down to Query

Drill down – check if there is any single query that could be the major contributor. Where is the major contribution coming from?

Example shows an active query, high DB time, with low OLAP & front-end time.

Double Click

No of runs

Highest DB time

Low Front-end time
System-wide monitoring with BWCCMS

The **Computing Center Management System** is part of SAP’s technology platform.

CCMS is SAP’s open, integrated infrastructure for:

- Centrally monitoring SAP landscapes comprising:
  - Components based on SAP Web Application Server, or SAP Basis Release as of 3.0
  - Other SAP components
  - Non-SAP components

- Background and print processing

- New with BW Release 3.52:
  - History data of the Central Performance History (CPH) can be transferred to SAP BW for efficient analysis
SAP Solution Manager: Central System Administration

Task

- Central administration of systems in one SAP solution

Solution

- SAP Solution Manager, Central Monitoring feature

Benefits

- Automated support of periodic and sporadic administration tasks
- Time savings due to central access to administered systems
- Automated logging of activities
- Reporting across the whole solution
SolMan System & Solution Monitoring – Data Collection

SAP Solution Manager

System Monitoring

Satellite Systems

Real-time Monitoring:
CCMS Monitoring Infrastructure (RZ20)

Continuous Monitoring:
Service Data Download (SDCC)

Detailed Reporting

SAP EarlyWatch Alerts
Solution Manager System Monitoring – Workflow

- System monitoring of core components to detect critical situations as early as possible
- Support administrators working with new SAP products
- System monitoring and Central System Administration complement each other
Solution Manager Monitoring: Integration of 3rd-Party Tools

SAP Solution Manager

CCMS Monitoring Infrastructure (“RZ20”)

Monitoring Infrastructure

SAP Solution Manager

3rd-Party System Management Console

3rd-Party Components

Monitoring Agent

Trigger console in case of an alert (SAPConnect; SNMP; XML)

Report Alerts

Detailed Analysis with 3rd-party tools
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Summary
What about your Data Volume growth?

DB growth: ~15 GB/month

DB growth: ~7 GB/month

Reduction: ~60GB
“Hard disk costs do not even represent a quarter of the memory costs”
(Giga Information Group)

“Administrative expense for 1 Terabyte of memory are appropriate for five to seven times more higher than the memory costs themselves”
(Dataquest/Gartner)
Data Aging Strategy Implementation

Data aging is a strategy for managing data over time, balancing data access requirements with TCO.

Each data aging strategy is uniquely determined by the customer’s data and the business value of accessing the data.

Which tools should I consider to use when?

<table>
<thead>
<tr>
<th></th>
<th>Online Database Storage</th>
<th>Near line Storage</th>
<th>BW data archiving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequently read /updated data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrequently read data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very rarely read data</td>
<td></td>
<td></td>
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</tbody>
</table>
Data Volume Minimization Strategies

**PSA Deletion:** Temporary inbound data load layer, exists for recovery or reload purposes.
- Retain daily loads 1 week, monthly retain 60 days
- Customer example: DB growing at 450 GB/month without PSA deletion, 150 GB/month with deletion

**ODS Object Change Log Deletion:** It’s like a PSA.
- Optimize ODS Object activation performance

**Caution:** Do not delete if ODS Object “generates” delta for the next level!

**Data Consolidation:** Eliminate redundant data
- Merge data from similar data marts
- Optimize aggregates
- Consider carefully number of ODS Object and InfoCube levels; aggressively archive and delete from “Data warehouse” layer
- Summarize at the InfoCube and aggregate level (RRI)

**Remote Access:** Use RRI, Virtual InfoProviders, UDI, etc: operational processing possibly might remain in OLTP system
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Summary
Architecture of SAP basis system supports multi-user environment: If number of concurrent users grows significantly, you can add more application servers.

Scalability via multiple application servers.
Assumptions and Findings:

- One navigation in BW (drill-down, filter, etc.) = ~9 dialog steps
- A medium type query is 1.5x the load on the DB server as an easy query
- A heavy query exerts 5 times the load on the DB server as an easy query
- Users of a specific category do not only run queries of the corresponding category

Query Type: Distribution Assumptions

<table>
<thead>
<tr>
<th>User category</th>
<th>Easy</th>
<th>Medium</th>
<th>Heavy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Consumers</td>
<td>90%</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>Knowledge Workers</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
</tr>
<tr>
<td>Authors &amp; Analysts</td>
<td>0%</td>
<td>10%</td>
<td>90%</td>
</tr>
</tbody>
</table>
Sizing and Re-sizing: Preparing for New Project Phases

SAP recommends to **work closely with the hardware vendors** to ensure your system is sized properly.

**Quicksizer**: SAP-delivered tool for estimating hardware sizing requirements
- Only useful in conjunction with HW vendor assistance

**Estimates** of concurrent user load and data volume, if obtained at project startup, may not be sufficient for future project phased implementations!

**Recommendations**: If project scope changes significantly (in terms of expected data volume or number of concurrent users), conduct a capacity planning session where sizing estimates are revisited
- Work with business owners to get realistic user numbers
- Analyze to estimate potential data volume
- Use the Quicksizer in re-sizing
- Work with hardware vendors
Summary

- Use process chains heavily to automate and monitor critical and important system tasks
- Build process chain development into project plan, organize effort around comprehensive BW administration strategy
- Good use of available tools for system monitoring can help ensure a smooth running system and good performance
- Best practices for data management entails deleting PSA data regularly, active capacity planning, use of archiving and consideration of near-line storage option
- Effective collaboration between technical and functional team members is necessary for successful BW system management
Further Information

Public Web:
http://www.sap.com  > Solutions  > NetWeaver

SAP Online Help:
http://help.sap.com  > NetWeaver  > BI

SAP Service Marketplace:
http://service.sap.com/bw
- BW InfoIndex – Process Chains
- BW InfoIndex – Archiving
- BW InfoIndex – BW Statistics
- Partner – Certified Software Partners

www.service.sap.com/education
- BW360  BW Administration & Performance (5 days)

SAP Developer Network
http://www.sdn.sap.com  > Business information Warehouse
Questions?

Q&A