Change the Query Cache Mode

Applies to:

This article applies to BW 3.x and SAP Business Intelligence (BI 7.0) with highest support package.

For more information, visit the EDW homepage.

Summary

This document explains about to change the query cache mode to improve the query performance.

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Introduction

SAP by default sets all infoproviders to the setting below:

*Main Memory Cache without swapping.*

This setting makes all subsequent queries of the infoprovider in question to inherit the cache mode by default. We can override this on a query by query basis by using transaction RSRT.

In this document, we will be discussing only the query cache mode *(4 Persistent Cache across Each Application Server)* and how to set it up on a per query basis.

What is OLAP Processor?

The OLAP processor is a query management tool that translates the query defined by the end user into a language specific to the database. Then, it returns the data stored in the infoproviders to the front end in a formatted view. Data access does not occur directly on the data stored in the database; rather it is accessed with OLAP Processor.

What is OLAP Cache?

The OLAP Cache is a performance tool to use for optimizing query runtimes. The OLAP processor has a memory area that stores the result of every query in the main memory of the application server, or in tables or files. By storing the query results, new calls of the query with the same selection criteria, or subsets of the query, don't require another selection in the database-instead, they can be answered from the faster cache memory of the application server.

Query Monitor.

We use the query monitor to test or regenerate queries and query views, and to check or change query properties. With the query monitor you have the option of displaying technical information about queries. Furthermore, the query monitor allows entry into the cache monitor. The OLAP cache monitor is the central monitoring tool for the OLAP cache. We can use the OLAP cache monitor to obtain a view of the global cache parameters, analyze the memory use of the query runtime objects, and analyze the underlying, current cache structure.

Query Properties.

In the Query Properties window of the Query Monitor, we can configure settings for the Read Mode, Cache Mode etc.

The read mode of a query determines how often the OLAP Processor retrieves data from the database during query navigation. The read mode contains three types of read processes:

- **Read all data (setting A: Query to Read All Data At Once)**
- **Reread the data (setting X: Query to Read Data During Navigation)**
- Reread the data when expanding a hierarchy (setting H: Query to Read When You Navigate or Expand Hierarchies)

The Cache Mode of a query determines the info provider to set the type of storage for query results calculated by the OLAP Processor. The Cache Mode options are:

- Cache is inactive
- Main memory cache with/without swapping
- Persistent cache per application server or across application servers

**Global Cache Parameters**

You can set the global cache parameters via the SAP BW customizing menu using Transaction SPRO: SAP Customizing Implementation Guide • SAP Net-weaver • SAP Business Information Warehouse • Reporting relevant Settings • General Reporting Settings in Business Explorer • Global Cache Settings

Storing the query results in the OLAP cache requires additional memory in the main memory of the application server. The size of the OLAP cache must be appropriate to manage the frequency of query calls and the number of users. The size of the global cache depends on the size of the local cache. Cache objects that are no longer used are deleted from the roll area when the size of the local cache is exceeded—for both types of cache objects.

We can configure the Cache parameters using the Transaction Code RSCUSTV14.

We can find lot of articles and blogs related to read mode, so we are not discussing in detail about this.
Background

What this default Cache mode does (Main memory cache without swapping) is that when SAP routes you to a specific application server, the server first checks if a user ran the same report in the same way (between loads to the infoprovider or changes to system settings like currency) on that server, if it doesn’t find the answer it goes to the database and gets this answer. It then stores this answer on the application server level. This doesn’t work too well when you have multiple application servers though, where if you have 4 people asking the same question hitting a different application servers, the system has to ask the same question 4 times potentially (if each person hits a different application server).

So if we change the cache mode to setting 4 Persistent Cache across Each Application Server and choose the mode Cluster Table option, we can create a situation where the work the system does for one user can be shared amongst the others. There are also times when we don’t want to use the cache at all, not even storing and managing it in the main memory of the application server. In situations where we are retrieving a significant amount of information and transferring it to the users PC or when the execution takes a significantly long time, this is when we want to use the setting 0Cache Inactive in the cache mode field. All of these situations regarding queries should be looked at on a case by case basis to determine the best fit for the cache setting.

Persistence Mode for 4.

Flat file - Cache objects are stored as files in a directory on the application server or across several application servers on a network.

Cluster table - Data is stored as a non-transparent cluster table in the database (depends on the cache mode with or without application server in the key).

BLOB table - Data is stored as a transparent table with BLOB in the database (depends on the cache mode with or without application server in the key).
How to setup query caching for a given query

1. Go to Transaction RSRT

2. Choose your particular query
Click on the Properties button. You will get the following screen.

3. Click the drop down on the Cache Mode option and select 4. For the ‘Persistence Mode’ selection, choose Cluster Table.

4. Then you need to generate the query by clicking on the ‘Generate Report’ button.
5. To monitor which queries are being cached and by whom, click on the ‘Cache Monitor’ button, you will get the following screen.

6. Click on the ‘Cluster’ button on the far right to see how the system is managing the query. When you click on the ‘Cluster’ button and expand the query directory out you will be able to see all the queries that are set up with the cluster setting. This way, if a user runs a report, the results are stored centrally so that the next user (who could be routed to another application server) running the same report in the same manner will get the results right away without having to regenerate the results from BW.

7. If you double click along the Query Directory you will see the last time results were stored, which results were stored and when they were last retrieved.
Conclusion

This Cache mode, **4 Persistent Cache across Each Application Server** and choose the mode **Cluster Table** is recommended for a BW Landscape with multiple application servers in which data is stored on a central DB and shared with all application servers.
Related Content

http://www.help.sap.com

Performance Tuning with the OLAP Cache

For more information, visit the Business Intelligence homepage
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