

DB2 Feedback Mechanisms



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Have you ever tried to find out exactly what is happening when you run a query? DB2 UDB for iSeries has multiple feedback mechanisms which this article will compare and contrast.

Automatic Index Advisor

Prior to V5R4 you needed to run Visual Explain or the Database Monitor to identify the indexes recommended by an individual query. With V5R4 the system automatically collects and groups index advice based on all queries that have been executed in the system. Typically SQE will provide better index advice than CQE. With CQE the index advisor uses local selection criteria to recommend an index. With SQE the index advisor will also consider the GROUP BY and JOIN clauses and may recommend an Encoded Vector Index (EVI) in addition to binary radix indexes.

SQE Plan Cache

One of my favourite enhancements in V5R4 is the addition of a graphical interface to the single, system-wide “always on” SQE Plan Cache. This is where SQE stores all its access plans or its instructions on how to run a requested query most efficiently with the lowest cost.

How often have your users called to tell you about a query that has just run much longer than expected? One great benefit of the SQE plan cache is the capability to look at these queries that have already completed execution. You no longer have to start a monitor and then ask the user to rerun the “problem” query. The plan cache contains the actual query plan as well as the run-time information for the query.

Print SQL Information

PRTSQLINF is roughly equivalent to the SQL “EXPLAIN” statement and produces text messages in a spool file or iSeries

Navigator window. It is not being enhanced with all the new optimizer capabilities.

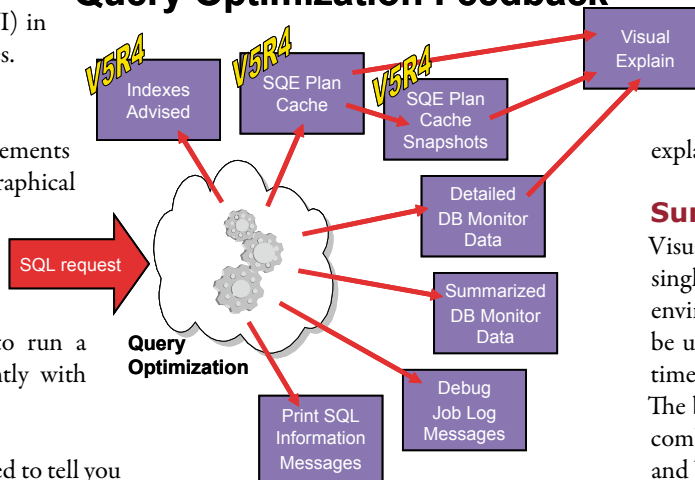
Debug Messaging

By turning on debug the optimizer messages are sent to the joblog. This facility is also not being kept up-to-date with the latest enhancements to the query optimizer.

Detailed Database Monitor

When the detailed monitor is activated, data describing the query optimization, open processing and query execution is stored in a single table. V5R4 enhanced the pre-filtering capabilities. The filtering allows you to shrink the amount of data captured and reduce the overhead incurred when running the detailed database monitor.

Query Optimization Feedback



Two additional features in V5R4 are a dashboard which has been added to iSeries Navigator to assist with the database monitor analysis, and the capability to invoke Visual Explain from the new filtering and analysis results display.

Summary Database Monitor

This monitor is started and stopped via the iSeries Navigator graphical interface or APIs. There is no OS command interface provided. Where the detailed monitor will record every SQL request, the sum-


mary monitor will summarize multiple optimizations and executions of the same query resulting in a more compact and less detailed data. The overhead is less since the summary data is held in memory and inserted into tables only when the monitoring is completed. One concern might be that a query cannot be visually explained from summarized data.

Visual Explain

Here is where you can see that a picture really is worth a thousand words. Visual Explain produces both graphical and textual information from the detailed monitor data or the SQE Plan Cache. Using Run SQL Script you can submit your query and have it run and explained or simply explained without ever executing.

Summary

Visual Explain is great at representing a single query’s access plan and its execution environment. The database monitor can be used to analyze SQL performance over time, a set of users, or a specific SQL request. The best analysis is often done through the combined use of the database monitor data and Visual Explain.

A much more detailed white paper written by **Michael Cain** and myself, will shortly be available on the DB2 UDB for iSeries home page www.ibm.com/series/db2. 

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