IBM

Information Management software

IBM Optim Query Workload Tuner

Optimize application performance to help reduce costs and increase client satisfaction

Highlights

- ***Optimize the performance of SQL queries and query workloads to improve application performance and client satisfaction***
- ***Solve query performance problems before they cause costly outages***
- ***Improve statistics collection to spend CPU cycles only on relevant information***
- ***Lower total cost of ownership through optimal use of IBM® DB2® for z/OS®***
- ***Receive expert advice to help broaden query tuning skills***
- ***Perform what-if analysis on schema changes without altering the database***

Application performance affects your business

Delivering applications that meet client expectations and service-level agreements (SLAs) is challenging. Aggressive project delivery schedules and limited resources can make it difficult to achieve necessary performance levels. Further, applications generally slow down over time due to increased workloads and changes in the database environment. In many cases, applications outgrow their original design parameters.

SQL optimization is a critical piece of the application performance puzzle. When SQL queries and workloads in applications are not tuned for optimal performance, they can impact SLAs, consume precious resources or, in extreme situations, cause application outages. Application degradation puts revenue at risk and negatively impacts customer satisfaction. It also drives up infrastructure costs.

However, SQL optimization is often given short shrift. Writing good code and writing optimized SQL require different skill sets. Application developers tend to focus on the former, but not necessarily the latter. Developers also often rely on programming frameworks to automatically generate the SQL they need.

Of course, organizations do have SQL experts: database administrators (DBAs). But isolating, evaluating and addressing SQL issues during development are difficult and time-consuming. The highly experienced DBAs who would do this work have hectic schedules and many responsibilities. Constantly in "react" mode, they often have little time for proactive performance management.

Given this reality, a lack of focus on query optimization during development, combined with the specialized skills and time needed to understand SQL performance problems, means SQL performance issues are often not discovered until they are in a production environment under full loads.

Tuning SQL statements: A daunting challenge

Even when a problem query is having a noticeable, negative impact on performance, a quick fix is rarely possible. Tuning is a challenging process: simply finding the problem can take hours of interpreting cryptic performance diagnostics, and choosing which statistics to collect and which to ignore to conserve compute resources can be confusing. SQL statements may span pages; identifying even a single access path can be incredibly complicated when different indexing scenarios are taken into account.

After a problem is identified, new challenges arise. Tuning a single SQL statement is difficult even for an experienced DBA. Tuning a group of queries or a query workload is an order of magnitude more complex. Workloads typically contain thousands of SQL statements analyzing each of these statements requires a lengthy, manual effort. After a review of each statement, the DBA must consolidate the findings and apply a solution across the workload. This is an extremely error-prone process that requires deep technical skill.

What if your DBAs had help in automatically analyzing and identifying performance enhancements for queries and workloads? Could they respond to urgent performance issues more quickly? Could your DBAs do more proactive tuning to reduce database cost of ownership? Would you be able to better meet service-level objectives?

SQL workload tuning helps organizations optimize performance

IBM Optim™ Query Workload Tuner empowers DBAs to more efficiently manage performance by proactively optimizing the performance of SQL queries and query workloads. Built on an open-source Eclipse-based environment, Optim Query Workload Tuner makes it easy to access candidate queries and define workloads from a number of common sources including:

- *The DB2 catalog (e.g., SQL from packages or stored procedures)*
- *The dynamic statement cache*
- *IBM Optim Development Studio*
- *A text file*
- *IBM DB2 Query Monitor*
- *IBM Tivoli® OMEGAMON® XE for DB2*

With Optim Query Workload Tuner, DBAs can efficiently capture, format and analyze SQL statements and workloads, creating graphic visualizations of query plans and costs. For DBAs, the solution removes much of the tedium and time from query analysis by formatting queries for readability, annotating them with statistics, visualizing the access plan and more.

As DBAs analyze problem queries, Optim Query Workload Tuner recommends improvements to query design. For example, the tuner might identify a query change that uses a different, more efficient index; the software also identifies indexes that can reduce database scans.

Optim Query Workload Tuner also helps improve the quality and efficiency of an organization's database statistics. Many organizations don't know the best statistics to collect, so they over-collect. Optim Query Workload Tuner can help DBAs identify what needs to be gathered and what is not needed, reducing cycles that would otherwise be wasted collecting statistics that don't improve performance. DBAs can also use Optim Query Workload Tuner to track query performance improvements. By aggregating performance data in a query warehouse, DBAs can readily see and track the effect of changes over time, enabling them to detect positive and negative performance trends more quickly.

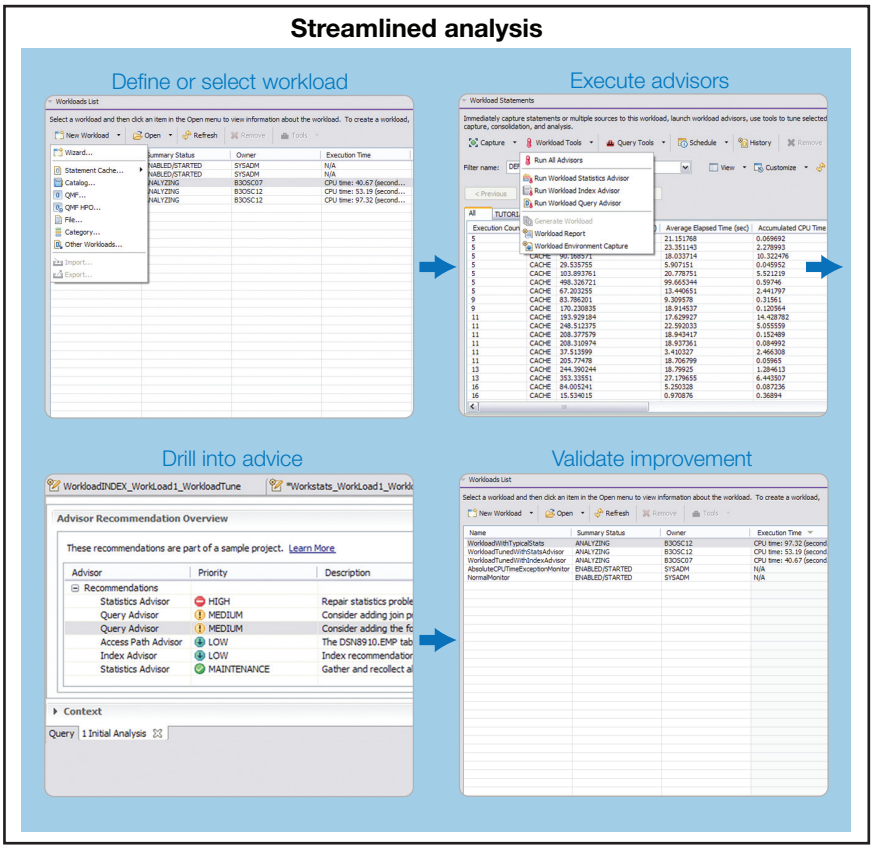

Figure 1: IBM Optim Query Workload Tuner provides a four-step process that helps DBAs quickly and efficiently target performance issues and identify solutions.

Optim Query Workload Tuner streamlines query tuning

Optim Query Workload Tuner enables DBAs to tune queries and query workloads in four steps (see Figure 1):

1. *Define or select queries or query workloads; Optim Query Workload Tuner integrates with DB2 and other tools, so DBAs can point and click to capture the SQL statements of interest*
2. *Select which advisors to run and execute them all at once, in groups or one at a time*
3. *Get instant, prioritized feedback regarding the relative importance of implementing the recommendations; drill into recommendations to understand both the rationale for changes and how to make them*
4. *Validate improvements by reviewing the estimated costs or compare the access paths before and after optimization*

IBM Optim Query Workload Tuner provides the following visualizations and advisors:

- ***Statistics Advisor*** *considers a query or set of queries and looks for missing, incomplete, obsolete and conflicting statistics that might lead to suboptimal performance. The Workload Statistics Advisor provides a consolidated set of statistics recommendations that apply to the workload, and provides RUNSTATS jobs to help improve the performance of the workload as a whole.*
- ***Query Advisor*** *uses best-practice rules and recommends ways to rewrite queries to improve the performance of the individual query or entire workload.*
- ***Index Advisor*** *provides advice on new indexes that may improve performance of a query or workload and allows DBAs to experiment with what-if scenarios. Index Advisor also provides the ability to define virtual indexes that will be considered by the optimizer when it calculates the cost of a query. With virtual indexes, DBAs can validate index designs before they are deployed.*
- ***Query Report*** *identifies key statistics, access path information and physical database design information related to a query or workload.*
- ***Access Plan Graph*** *provides a graphic view of the access plan chosen by the optimizer for a query, helping the DBA quickly understand the SQL access path.*
- ***Query Annotation*** *formats the query with collapsible sections and highlighting to improve readability and navigation through complex queries. It also includes catalog statistics and cost estimates for the tables and columns used in the query.*
- ***Access Path Advisor*** *examines the access plan chosen by the optimizer and identifies access paths that commonly cause suboptimal query performance. The warnings provided by the access path advisor can help DBAs know where to look for trouble in the access plan graph.*
- ***Visual Plan Hints*** *give DBAs the ability to set criteria to assist the cost-based optimizer in selecting the optimal execution plan. It also provides a visual interface to simplify the deployment of optimization hints.*

Bottom-line value across your enterprise

IBM Optim Query Workload Tuner helps DBAs improve performance and reduce overall development cost, providing SQL workload and query tuning advice that maximizes application performance while reducing reliance on specialized skills. Its easy-to-use advisors enable DBAs of any skill level to monitor and tune queries to minimize performance problems. Built-in workload and query capture capabilities, as well as integration with Optim Development Studio, enable DBAs to work proactively with architecture and development teams to optimize performance during preproduction when it is inexpensive—avoiding downstream critical situations.

Optim Query Workload Tuner is integrated with query monitoring tools such as DB2 Query Monitor and Tivoli OMEGAMON XE to provide a more complete solution for monitoring and tuning SQL. This integration helps organizations reduce the risk of customer complaints, missed SLAs and financial losses due to performance problems.

About IBM Optim Integrated Data Management solutions

IBM Optim Query Workload Tuner is part of the IBM Integrated Data Management portfolio. IBM Optim Integrated Data Management solutions offer proven, integrated capabilities to manage enterprise application data from requirements to retirement. With Optim, teams can share data artifacts (like models, policies and metadata) to align data management with business goals and improve collaboration.

Today, organizations of all types leverage Optim to improve performance, streamline database administration, speed application development and enable effective governance. Optim can deliver better business outcomes, at lower cost and with less risk, while providing capabilities that scale across enterprise applications, databases and platforms.

For more information

For more information about IBM Optim Query Workload Tuner and IBM Integrated Data Management solutions, please contact your IBM sales representative or visit **ibm.com**/software/data/optim

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