



Commentary

Analysis of Query Optimizers

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Abstract

A query optimizer translates a query into a sequence of physical operators that can be directly carried out by the query execution engine. The goal of query optimization is to derive an efficient execution plan in terms of relevant performance measures, such as memory usage and query response time

The query optimizer attempts to determine the most efficient way to execute a given query by considering the possible query plans. Importance: The goal of query optimization is to reduce the system resources required to fulfill a query, and ultimately provide the user with the correct result set faster. This is a feature of many relational database management systems and other databases such as graph databases.

Keywords

Query optimization; optimized; computing

Introduction

Query optimization is the overall process of choosing the most efficient means of executing a SQL statement. SQL is a nonprocedural language, so the optimizer is free to merge, reorganize, and process in any order. The database optimizes each SQL statement based on statistics collected about the accessed data. Query optimization involves three steps, namely query tree generation, plan generation, and query plan code generation. A query tree is a tree data structure representing a relational algebra expression. The tables of the query are represented as leaf nodes. Importance: The goal of query optimization is to reduce the system resources required to fulfill a query, and ultimately provide the user with the correct result set faster. ... Secondly, it allows the system to service more queries in the same amount of time, because each request takes less time than optimized queries.

When you issue a query that selects rows, MySQL analyzes it to see if any optimizations can be used to process the query more quickly. For additional information about optimization measures that MySQL takes, consult the optimization chapter in the MySQL Reference Manual.

Query processing denotes the compilation and execution of a query specification usually expressed in a declarative database query language such as the structured query language (SQL). Query processing consists of a compile-time phase and a runtime phase. We have seen so far how a query can be processed based on indexes and joins, and how they can be transformed into relational expressions. The query optimizer uses these two techniques to determine which process or expression to consider for evaluating the query.

Optimization is an act or methodology of making something (such as a design, system, or decision) as fully perfect, functional, or effective as possible specifically: the mathematical procedures (such as finding the maximum of a function) involved in this. It can analyze your database and suggest settings to improve performance. For example, it may suggest that you raise the `query_cache_size` parameter if it feels like your system can't process queries quickly enough to keep the cache clear. The second tuning tool, useful for most modern MySQL databases, is MySQL Tuner.

MySQL performance queries by using `<select your MySQL cluster> → Query Monitor → Running Queries` (which will discuss later) to view the active processes, just like how a `SHOW PROCESSLIST` works but with better control of the queries. It's because SQL Server wants to do a hash match for the `INNER JOIN`, but does nested loops for the `LEFT JOIN`; the former is normally much faster, but since the number of rows is so tiny and there's no index to use, the hashing operation turns out to be the most expensive part of the query.

Citation: Ramineni Sk (2021) Analysis of Query Optimizers

J Comput Eng Inf Technol 10:1 .DOI: 10.37532/jceit.2020.10(1).248

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Received: December 28, 2020 Accepted: January 13, 2021 Published: January 20, 2021

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