SQL PERFORMANCE: GUIDELINE FOR TUNING THE SQL QUERIES IN ORACLE RDBMS

A dissertation submitted to the Graduate School in partial
fulfillment of the requirements for the degree
Master of Science (Information Technology),
Universiti Utara Malaysia

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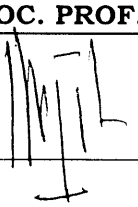

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ABSTRAK

Sistem Pengurusan Pangkalan Data (SPPD) ialah sistem yang kompleks, di mana ia mengandungi himpunan sistem-sistem dengan tugas-tugas yang spesifik dan akan berinteraksi dengan pengguna applikasi dan pangkalan data. Terdapat pelbagai aktiviti yang akan menyebabkan kemerosotan prestasi pangkalan data dan apabila ia berlaku, adalah amat penting untuk mendiagnosa, menganalisa dan menyelesaikan masalah ini secepat mungkin. Penyelidikan ini akan memfokus kepada kemerosotan prestasi pengkalan data yang disebabkan oleh 'SQL Query'. Kebanyakan pengaturcara applikasi dan DBA menghadapi masalah untuk memahami langkah-langkah yang sepatutnya diambil untuk mempercepatkan pemprosesan 'SQL Query'. Garis panduan ini akan mengenalpasti factor-faktor yang menyebabkan kemerosotan prestasi pangkalan data dan 'SQL' yang bermasalah dan seterusnya menganalisa 'SQL' tersebut. Berdasarkan penyelidikan dan rujukan teknikal, satu metodologi untuk pembangunan garis panduan untuk mempercepatkan 'SQL Query' telah diperkenalkan. Item dalam metodologi tersebut termasuklah mendapatkan maklumat, menyediakan persekitaran untuk kajian, merancang kes kajian, mengenalpasti 'SQL' bermasalah, menggunakan alatan untuk mempercepatkan 'SQL' bagi menganalisa, proses pengkodan dan proses analisa. Keputusan daripada analisa dan kajian telah dikompil, disusun dan seterusnya dijadikan garis panduan untuk mempercepatkan 'SQL Query'. Garis panduan yang dihasilkan dikagegorikan kepada tiga bahagian. Bahagian yang pertama menerangkan tentang skrip untuk mengenalpasti SQL yang bermasalah. Bahagian yang kedua mengenai 'SQL Counter' iaitu program yang telah dibangunkan bertujuan untuk mengenalpasti 'SQL' yang bermasalah di dalam 'nested procedure'. Apabila 'SQL' telah dikenalpasti, alat untuk menganalisa 'SQL' dengan tujuan mencari masalah 'SQL' tersebut dan mempercepatkannya digunakan. Eksperimen telah dijalankan untuk menghasilkan garis panduan ini dan juga untuk membuktikan ia dapat mencapai objektif yang telah ditetapkan. Kesimpulannya, garis panduan ini dapat menjadi praktis yang bagus dan amat berguna untuk pengaturcara SQL atau pun DBA.

ABSTRACT

DBMS is a complex system that is composed of a collection of subsystems, each with a specific task and will interact with the user application programs and the database. Maintaining DBMS performance is a challenging task. Many events can cause the database poor performance and once it occurs, it is important to diagnose and resolve the problem quickly. The research will focus on poor performance caused by SQL Query. Most of application developer and DBA have problem to understand the SQL Query tuning step. This guideline will determine the cause of database performance problem, identify the bad SQL and analyze it. Based on the literature review, methodologies have been introduced which cover all the steps needed to come out with a guideline. The methodology stages are gathering information, set up environment, design test cases, identify problematic SQL, use tuning tool to analyze the SQL, coding process and analysis. The results from the analysis and experiment have been compiled and arranged to get the SQL Query Tuning Guideline. This guideline has been separated into 3 sections. Firstly, explains on the scripts to identify the problematic SQL. Secondly, on the SQL Counter, the program that has been developed in order to spot poor performance SQL in the nested procedure. Finally, using tuning tool, Explain Plan and TKPROF to analyze the SQL statement. Experiments have been conducted in order to output this guideline and to prove that this guideline is able to help the user to tune the SQL. Furthermore, this guideline also introduces a new technique, SQL Counter, in identifying the problematic SQL in the nested program or sub query. This guideline can be a good practice to the developers or the DBAs themselves and can be regard as one useful recommendation.

ACKNOWLEDGEMENTS

I would like to express my gratitude to all, in one way or another, contributed to the work of the thesis and for the completion of my Master Degree study.

First and foremost, I would like to thank my supervisor, Assoc. Prof Nazib Nordin who has been extremely supportive and patience in dealing with me. My journey has not always been easy, but he has been with me every step of the way. He had given encouragement during my ups and downs especially at the time when I lost my beloved father. At that time, I feel so weak, disappointed and down until I feel that I could not carry on with this research. His advice and motivation makes me realize that life needs to go on.

Heartfelt thanks to my colleague at work, Mohd Suhaimi, Annusia, Zaidah Hanim, Shakirah who had given their views and comments to me until the completion of this research.

I would like to express my truthful thanks to my beloved parents, for their prayers and constant support. A very special thanks to my father, Allahyarham Md Khushairi Budin. He is my idol ever after. I would not forget his courage to see me as a person that I am now. Not forgetting, my mother, Aishah Isa, who always been caring and supportive.

Utmost thanks to my beloved husband, Mohamed Rodzi, for giving me the chance to further my studies. Thanks for the understanding, patience and support because without this I could never complete my studies.

Last but not least, my gratitude to God for giving me the courage to persevere with high dedication till the accomplishment of my Masters degree study.

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INTRODUCTION

1.1 Overview

Achieving a high level performance from a Database Management System (DBMS) has been a difficult task. Maintaining data integrity and supporting concurrent users introduce a significant amount of overhead to a DBMS. This overhead affects the ability of the DBMS to serve the data to the users quickly. As such, decreasing the overhead of DBMS while maintaining data integrity and providing information to the user as quickly as possible has been the main objective of database operation in organizations. It involves determining which of the numerous resources need to be adjusted in order to solve the performance problems. Performance issues are often not identified until the developer has done the coding, either in the integration testing, Quality Assurance (QA) or worst case, at run time (LeccoTechnology, 2002). Currently, developers focus mainly on how to code a SQL statement to retrieve the correct set of data from the database.

The contents of the thesis is for internal user only

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