The Query Optimizing for the DECOMMIS

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1. Introduction

The information on the decommissioning activities of the nuclear facilities, in terms of the removal and recycling of that, is the importance of being a very highly. It contained the important point of the duration and budget on the management of decommissioning project. Because of this, other countries, the United States, Britain, France, Germany, and Japan are established and be applied the database system for doing work in the decommissioning. The KAERI (Korea Atomic Energy Research Institute) has developed the DECOMMIS (Decommissioning Information Management System) and have been applied for the decommissioning project of the KRR (Korea Research Reactor)-1&2 and UCP (Uranium Conversion Plant), as the meaning of the first decommissioning project in Korea. All information and data which are from the decommissioning activities are input, saved, output and managed in the DECOMMIS. This system was consists of the web server and the database server. The users could be access through a web page, depending on the input, processing and output, and be modified the permissions to do such activities can after the decommissioning activities have created the initial system-wide data is stored. During the operation of the DECOMMIS, some problems were appeared with the operation speed of the output session. And it was found that caused accordance with the one-dimensional query problem. The one-dimensional queries alone felt the limitations bar was done to optimize the query. In this paper, an optimized query do optimization of the DECOMMIS and comparison with the assessment of the existed query execution time shows that the improved performance.

2. Methods and Results

In this section, the general methods of the query optimization are described as of the query optimizing, the query optimizing techniques and the query optimizing for the DECOMMIS.

2.1 Query Optimizing

Some of the queries are should be to do optimization. Because the JOIN operator in SQL is spent much time and cost. Moreover the nested JOIN operator can be stopping the system. The heavy system, likes the DECOMMIS, is even more serious. When the "SELECT" clause is called, it needs as much memory space as reference tables. Therefore many nested JOIN operator needs so much memory space and it also needs lots of time for response to the user. In several cases, it cause of system down. Actually, it is happened the DECOMMIS was once down for this reason.

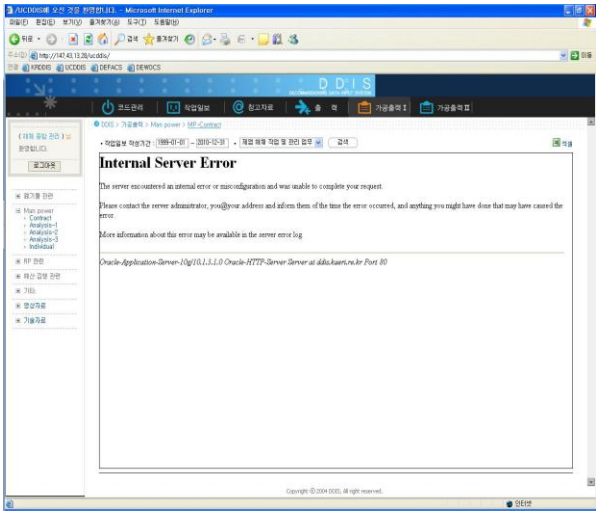

Fig. 1. Web page fail because the timeout

2.2 Query Optimizing Techniques

Most of the commercial DBMS (Database Manipulation System) offer the 'OPTIMIZER' that does optimization automatically for user. Actually the Optimization is very difficult by manual. In order to optimize by manual, user must know the relational algebra, overall knowledge of database including normalization and query graph. Also it needs the mathematical sense. In case of the "Oracle optimizer," it contains the query transformation module, execution plan generation module, costing module. With which each module through a better execution plan, it can be found by the query which is to be converted the optimized query. And also it is the JOIN for the order of execution built, and finally each for the Nested loop JOIN order and JOIN, sort merge, Hash JOIN, by the way, and the least expensive discovery queries find ourselves.

2.3 Query Optimizing for DECOMMIS

The DECOMMIS was used many "INNER JOIN." There are more hundred tables in the DECOMMIS that can be need more hundred "INNER JOIN" for the parameters from the web page forms. Thus Grouping and changing "JOIN" order required. Also field processing, the irregular and null check removed the occurred "Table Full Scan" phenomenon. Finally change incorrect using of the "WHERE" clause. The result of the "SELECT" clause calculation determines the scope of the "WHERE" clause the scan range, increased "JOIN" operator then query time would grow exponentially

Table I: Incorrectly WHERE clause

WRONG	MODIFY
Substr(field, 1, 2)='condition')	Field1 like 'condition%'
Where field1<>'condition'	'condition' and field < 'condition'
Where field*12=3500	Field=3500*12

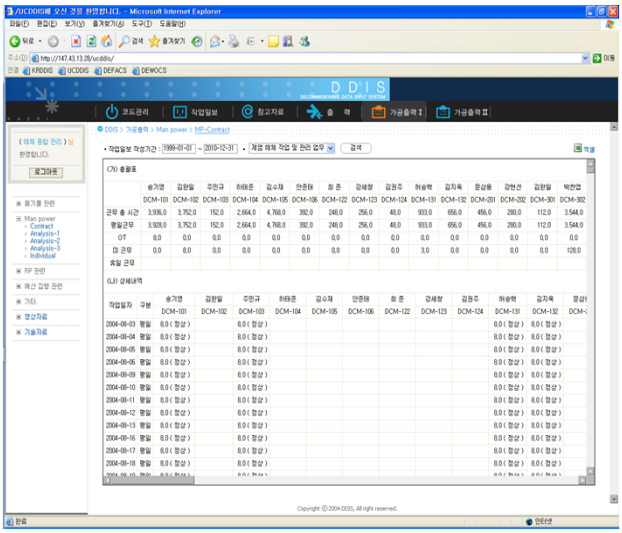

Fig. 2. Resolve the timeout problem

2.4 Performance Evaluation

The sequence parameter set and the operator have made conditional situation by the change of the optimization. The fig2 shows as 10% of the performance increasing and output. The output range reduced by parameter grouping, JOIN operator, through a sort order for the changes and reduced the amount of output. It is confirmed that the response time was faster between the web server and database server, thus eliminating the occurrence of a timeout to determine the overall performance could be improved.

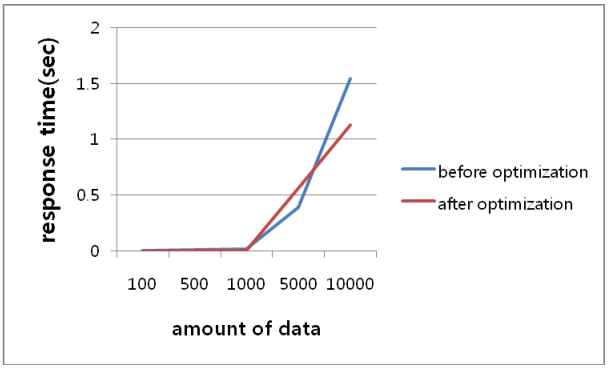

Fig. 2. Compare response time according query optimization

3. Conclusions

In this paper, with the vast amounts of data which are from the decommissioning activities and the management of the dismantled waste for the effective treatment for the query optimization methods were studied. In order to resolve the problems of the one-dimensional query, the several different optimization methods were used. Thereby, the improving the overall performance of the database was confirmed.

REFERENCES

[1] PARK, J. H., et al., Development of the Decommissioning Project Management System DECOMMIS, Rep. KAERI/TR-3401, 2007