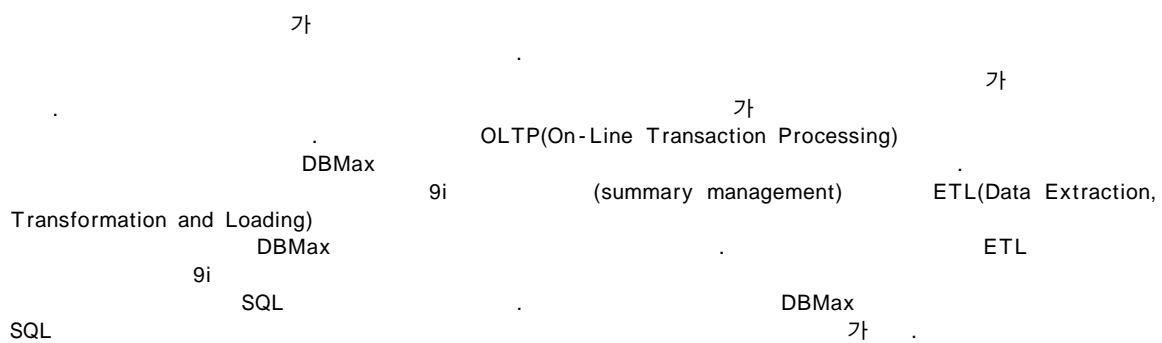


DBMax *

An Extension of the DBMax for Data Warehouse Performance Administration



Abstract

As the usage of database systems dramatically increases and the amount of data pouring into them is massive, the performance administration techniques for using database systems effectively are getting more important. Especially in data warehouses, the performance management is much more significant mainly because of large volume of data and complex queries. The objectives and characteristics of data warehouses are different from those of other operational systems so adequate techniques for performance monitoring and tuning are needed. In this paper we extend functionalities of the DBMax, a performance administration tool for Oracle database systems, to apply it to data warehouse systems. First we analyze requirements based on summary management and ETL functions they are supported for data warehouse performance improvement in Oracle9i. Then, we design architecture for extending DBMax functionalities and implement it. In specifics, we support SQL tuning by providing details of schema objects for summary management and ETL processes and statistics information. Also we provide new function that advises useful materialized views on workload extracted from DBMax log files and analyze usage of existing materialized views.

(data warehouse), (performance administration), (performance monitoring), SQL (SQL tuning), 9i(Oracle9i), (summary management), (materialized view), ETL, DBMax

1. 90 (ERP: Enterprise Resource Planning), (CRM: Customer Relationship Management) DBMS(Database Management System)

[1,2,3,4]

가 SQL 가

DBMax (:) 가

가 (GB) (TB)

Administrator) DPA(Database Performance Administrator) 1) , 2) 가 , , SQL , 3) [6,7].

DBMax

DBMax

DBMax OLTP(On-Line Transaction Processing)

SQL 가

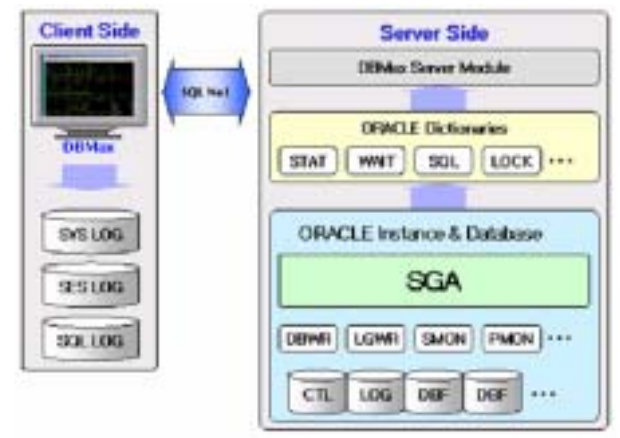
가

9i 가 (materialized

view) (summary management) ETL(Data Extraction, Transformation and Loading)

9i ETL

(1) DBMax [8]



(1) DBMax

(1) DBMax PL/SQL

SQL DBMax

DBMax

가 . 2 DBMax 9i

DBMax SQL*Net DBMax [9].

ETL . 3 DBMax 가 . 4 3

CPU, I/O, (STAT) (WAIT)

5 가 SQL 가 SQL SQL

2.1 DBMax

DBMax [5]

SQL DBMax

[9].

DBMax DBA(Database

2.2 9i

DBMS [10,11] ETL [12,14,15].

(summary)

3. 3.1 ETL 2 9i

3.1.1 9i [12] [10,16] (design)

(refresh) (maintenance) (exploitation) 가

[12,13,14].

■ ETL ETL

9i ETL CDC (Change Data Capture), (external table), upsert, (multi-table insert) SQL 가

(table function) 가

CDC

[12, 14] (capability) [12] 가 SQL 가 가 DBMax , SQL DBMax 가

upsert 가 ETL

SQL

가

가 SQL

SQL

SQL

3.1.2 ETL

2

SQL

(2)

[9]

가

SQL

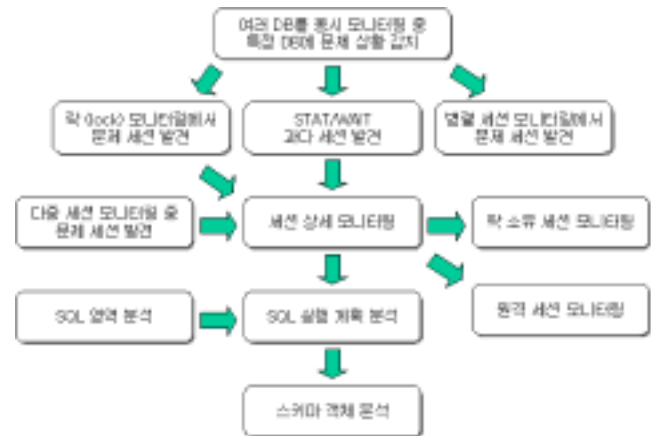
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(2)

(2) DBMax

SQL

ETL

, , SQL

SQL

가

3.2

DBMax

DBMax

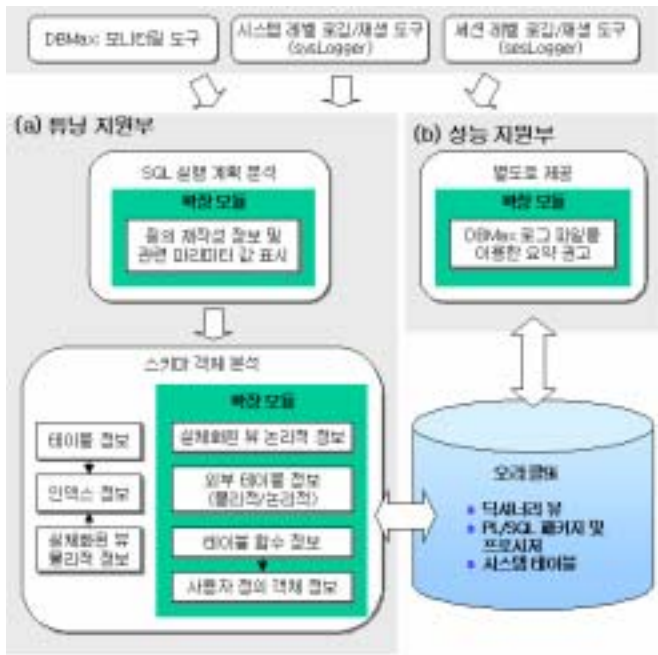
3.2.2

(3) DBMax

3.2.1 DBMax

SQL

DBMax



(3)

DBMax

DBMax

가

DBMax

SQL

< 1>

9i

PL/SQL

■

(3) (a)

	Windows 2000 Server
DBMS	9i
	PL/SQL 6.0
	ADO 2.6
	ODBC

PL/SQL

DBMax

PL/SQL

SQL

가

가

가

6.0

ODBC

가

4.2

4.2.1

가)

DBMax
 () SQL
 SQL
 SQL
 2>

< 2>

GET_PARAMS_VALUE		
GET_REWRITE_MSG	SQL	
GET_MVIEW_LIST		가

GET_REWRITE_MSG

9i

DBMS_MVIEW.EXPLAIN_REWRITE

REWRITE_TABLE

. GET_PARAMS_VALUE

GET_MVIEW_LIST

. < 3>

[17,18]

< 3>

GET_PARAMS_VALUE	V\$PAPAMETER
GET_REWRITE_MSG	ALL_MVIEWS

GET_MVIEW_LIST	DBMS_MVIEW.EXPLAIN_REWRITE REWRITE_TABLE
----------------	---

(4) SQL
 SQL
 (initialization
 parameter)
 가

가

(4)

(4)

가 가

가

SESSION ~ SET ~'

, GET_REWRITE_MSG

. < 4>

[12,17]

< 4>

QUERY_REWRITE_ENABLED	
QUERY_REWRITE_INTEGRITY	
OPTIMIZER_MODE	(/)
OPTIMIZER_FEATURE_ENABLE	

가

가

가



가 SQL

■

DBMax

DBMax

5>

< 5>

		GET_TABLE_PROPS
		GET_INDEXES
		GET_TAB_COLUMNS
		GET_MVIEW_PROPS
		GET_MVIEW_CAPABILITIES

GET_MVIEW_CAPABILITIES

9i DBMS_MVIEW.EXPLAIN_MVIEW

MV_CAPABILITIES_TABLE

< 6>

가

[17, 18]

가

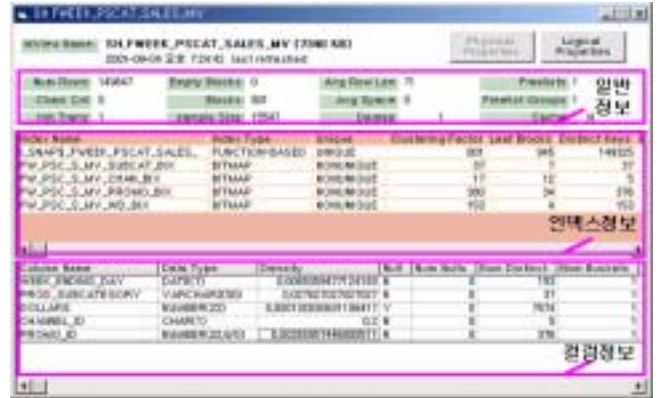
(5)

< 6>

GET_TABLE_PROPS	ALL_TABLES / ALL_SEGMENTS
GET_INDEXES	ALL_INDEXES
GET_TAB_COLUMNS	ALL_TAB_COLUMNS
GET_MVIEW_PROPS	ALL_MVIEWS ALL_MVIEW_REFRESH_TIMES
GET_MVIEW_CAPABILITIES	DBMS_MVIEW.EXPLAIN_MVIEW MV_CAPABILITIES_TABLE

(5) (a)

(b)



9i

17 가

[12]

가

(a)

(b)

(5)

■

DBMax

SQL

DBMax

(6)

가



(6)

(7)

(7)

가

가

< 8 >

[17]

가

가

< 8 >

< 7 > (6)

GET_TF_PROPS		ALL PROCEDURES
GET_TF_PROPS		ALL OBJECTS
GET_TXT_SOURCE		ALL_SOURCE

< 7 >

GET_TABLE_PROPS		ALL TABLES
GET_TAB_COLUMNS		ALL TAB _COLUMNS
GET_XT_PROPS		ALL EXTERNAL _TABLES
GET_XT_SOURCE		ALL EXTERNAL _LOCATIONS

(space) (dot)

(8) (7)

CURSOR_PKG



(8)

DBMax

SQL



(9)

< 9 >

DBMS_OLAP	
CREATE_ID	, , ID
LOAD_WORKLOAD_USER	
RECOMMEND_MVIEW_STRATEGY	
GENERATE_MVIEW_SCRIPT	SQL
GENERATE_MVIEW_REPORT	

ALL_OBJECTS
ALL_SOURCE

4.2.2

가 DBMax 가
, SQL

가

DBMax

DBMS_STATS.GATHER_SCHEMA_STAT

SQL

9i
DBMS_OLAP

DBMS_OLAP
DBMax
DBMax SQL

가

SQL

LOAD_WORKLOAD_USER

가
가
가 RECOMMEND_MVIEW_STRATEGY

가 SYSTEM.MVIEW_RECOMMENDATIONS

(10)

(a)

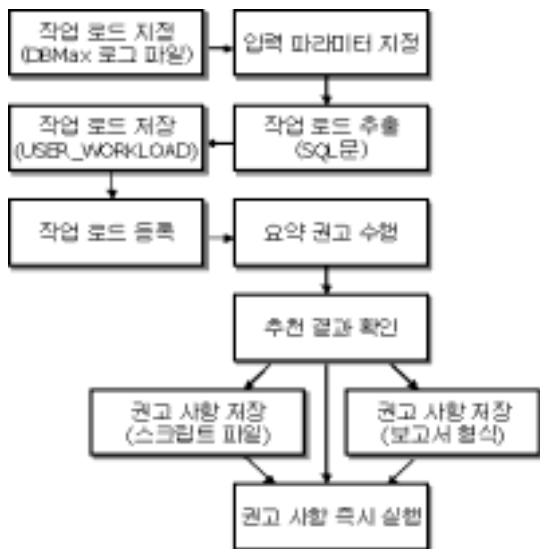
(b)

(9)

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가 DBMS_OLAP

[18]



(a)





(b)

(10)

(10) (a)

(b)

(10) (b)

4.3 가

DBMax OLTP

가

SQL

가

DBMax

DBMax 가

가

DBMax

가

DBMax

가

DBMax

SQL

5.

OLTP

DBMax

DBMax

9i

ETL

DBMax

SQL

SQL

SQL

DBMax 가

SQL

가

SELECT, INSERT ~ SELECT, UPDATE ~ SELECT

가

ETL

가

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1983

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1985

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1985 - 1989

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1991

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2002 -

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, OLAP



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