Data Migration System for Heterogenous Databases

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***Abstract:-*With the development of various systems reform in corporate world and With the development of database management systems there is need for up gradation from old database systems to desired DBMS. For example some organizations have their major databases in one database and other organization having different database. Then there is a constant need to migrate data from old databases to more recent ones database. Database Migration in Heterogeneous Database System is the system which wills the solution to such a problem.This paper is based on database migration project and detailed introduces technique issues of data migration involving manual work, which may contribute to organizations that have data migration demands.**

Keywords:-Mysql,Oracle,JDBC

I. INTRODUCTION

In this paper we study the approach and process of data migration. Especially, we introduce information the basic functions of each module in data migration process and the test procedures after data migration. The process of data migration has two steps. First, tables to be migrated, primary key and foreign key are created in object database. Then data in source database are migrated into object database. Data migration system as a component of database system is mature in technology and uniform in functions. There are three type of methods, namely, data migrated by tools beforehand, data migrated manually beforehand and data generated by new system afterwards. Data migration is the process of transferring data between storage types, formats, or computer systems. Data migration is usually performed programmatically to achieve an automated migration, freeing up human resources from tedious tasks. It is required when organizations or individuals change computer systems or upgrade to new systems, or when systems merge such as when the organizations that use them undergo a merger or takeover.

II. SYSTEM OVERVIEW

- Source database: The source database is a current database from which we want to migrate to other database.
- Add drive: In this one is going to select the drive which having the data stored on it.
- Establish the connection with the database: Here the connection between the database and the migration system are established using the JDBC, ODBC drivers.
- Match the data type: Match the data type of source database object from which category it belong.
- Check output: check the output whether it is correct or not.
- Output: This stage will give the final Output.
- Processing system: This section involves the processing through which data is going to migrate from one database to another database.

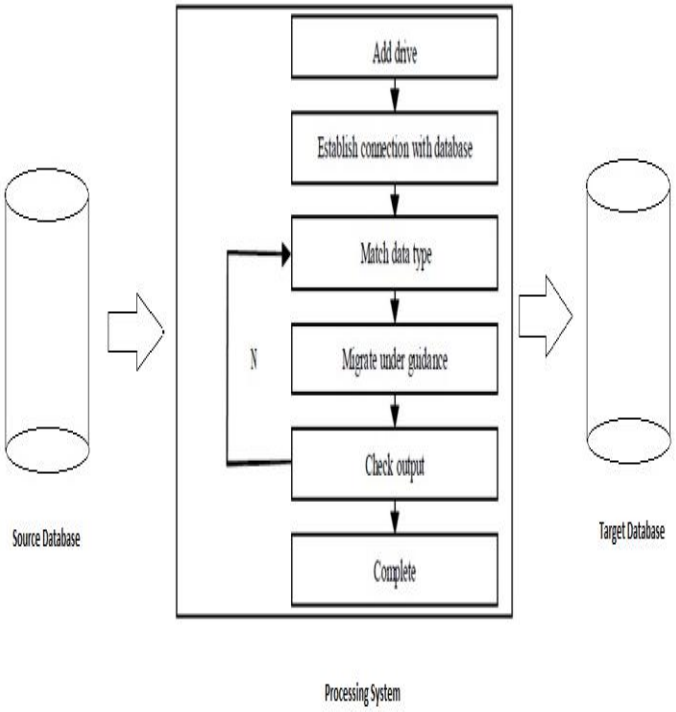

Figure 1 System Overview

III. EXISTING SYSTEM

A. Design and Application of DMS [1]

We referred as Significance of data migration and database technology has become the core technology of information system in each organization. Actual necessary of data migration in market. Scope of data migration in various fields e.g. banking. Implementation of data migration and hardware configuration like development platform. Flow chart of data migration contains step by step flow of modules. Design of data migration process. Referred relationship each data migration modules. Meaning of each modules for design data migration.

B. Migrating from COBOL to Java [2]

Referred as Project background for data migration system. We learn concept of data migration. And use logic of Migrating from COBOL to other database system.

C. XML-based Design and Implementation [3]

We referred concept of Heterogeneous database integration and how to handle SQL query in query manager. And also database integration system implementation.

D. Heterogeneous Data Integration Technology for Cooperative Database[4]

We referred Heterogeneous Data Integration Technology for Cooperative Database. We learn design view of cooperative database.

IV. DATABASE MIGRATION

A. Database Design

This consists of design of database. Initially we will create relational database. In this we will examine all the operations on database such as insertion, deletion, modification of records etc. The database will be stored in the form of object oriented relational database.

This will facilitate the user to insert the records in database. i.e. By using SQL insert query.

This will help the user to change or update the database. User will modify the records in database as per the requirement. i.e. By using SQL update query.

This will facilitate the user to remove the redundant data and records from database. i.e. By using SQL delete query.

Display all table in database with name. And display attribute of each table. i.e. By using SQL show database query.

B. Making Connection with Source Database

Here in this there will be connection establishment with the source database .Here source database is taken as a part of an user input in the initial state and connection is established with database by using the JDBC ODBC Connection.

a. a. Making connection

First step to create a connection

1. Open the ODBC data source in the control panel and click on add button.
2. New forms will be open where different drivers are listed from different database version. E.g. for MS Access, Oracle etc
3. To enter the path of database click on the browse button. Here notice that, select those directories from respective database tables which are to be migrated are present.
4. Give DSN name in the data source name field and finally click to ok.

b. Read Database Structure

By making connection with source database, read the Source database completely .In this source database how many tables, columns these are counted.

After connection is established with the source database we read following things.

- Overall database information.
- Name of database.
- Database version.
- No of tables in the database.
- No of attribute in the each table.
- Primary key, foreign key information for columns.
- Data type assigned to attribute.
- Size of each attribute.

C. Source Structure and JDBC Mapping

From above module source database structure are completely known .This obtained database structure are fitted in object database .The object database are created as per the target database by using programming concepts in Java.
Here we use,

- Structure of source database for creating object database.
- Provide option for different database system.
- Choose particular JDBC driver for connection with source DB to target DB system.

a. Select Structure Only

In this task we select the structure only of the source Database for migration .In this task.

- Convert only structure of source DB to target DB.
- Only the Structure of the table with constrains, data type and size of data type get migrate not the single record will migrate.

In this task we can select the structure of the source Database with record i.e data to be migrated.

b. Convert Source DB to Data Structure

In this task the read source database structure is converted to data structure as follows

- Previous modules return the total no of tables in database.
- Using this count put it into object database.
- Source table structure is converted into data structure with the help of creation of the class which will include the hole the attributes derived from the source database.

That will include,

1. field name
2. type
3. constraints
4. size
5. description about the attribute

D .Extraction and Fetching of Data

In this Data is fetched from the source database into an object database.

a. Read Data & fill into object database

In this task the actual data is read from the source database for fetching it into an object database.

- We read the data from the source DB & store it into the data structure that created previously.
- Specific classes from JAVA are used to perform this task.

b. Making target database connection

After selecting target database, we making connection with target database Here the JDBC driver set is used to do this.

First step to create a connection

1. Open the ODBC data source in the control panel and click on add button.
2. New forms will be open where different drivers are listed from different database version. E.g. for MS Access, Oracle etc
3. To enter the path of database click on the browse button. Here notice that, select those directories from respective database tables which are to be migrated are present.
4. Give DSN name in the data source name field and finally click to ok.

E. Convert Data Structure to Target Database

The data structure obtaining object database are mapping with table structure of target database & migrate data from object database to target database by using the query of create table of respective target database .We convert the data structure that are created by previous module into target structure in object database. The fields included are –

- All attributes
- Constraints like primary key, foreign key
- Data type
- Size
- Other description

F. Design Target Database

As per the users specified target database type, design the corresponding structure as per the database system type.

G. Target Database

In this module, final target output is generated. All input database given by user converted into respective database system.

a. a. Fill data in target database

The actual data is filled in the target database in this task. In this task we care for no data lose during database migration. The target database is created as per the user's specification which includes all the structure along with its data & constraints .To do this

- The SQL queries are used.
- All the structure is created as per the user's specification for the target database.
- All the fields are reflected into the target database as per the source database.

- All the constraints and other factor are maintained with respect to the source db into target DB.

b. Display Record in Target Database

The migrated data can be seen in this module. We can check whether data is migrated properly or not .The job of this task is just to display the content of the database and can be done by using the SQL queries and function for it.

V. EXPERIMENT SETUP AND RESULT ANALYSIS

In TABLE 1 we show system configuration like OS, RAM, CPU, Hard disc for various database like MS Access, MySQL, Oracle etc

TABLE 1 SYSTEM CONFIGURATION

OS	**Database**	**RAM**	**CPU**	**HD(GB)**
Windows XP	MS Access	3GB	3.59	320
Windows XP	Mysql	3GB	3.59	320
Windows XP	Oracle	3GB	3.59	320

In TABLE 1 we show time in millisecond for conversion (e.g. MS Aceess to Oracle) with number of table migrate in database. Database contains three tables each table having six attribute with 100 records in it. We can draw a graph with respect to conversion and time required by number of table shown in Fig.2

Note:

1. Test table contains 100 records with 6 attributes.
2. Time measured is in milli second.

TABLE 2 RESULT ANALYSIS 1

Conversion	Time for No. of table		
	1 tables	2 tables	3 tables
Access to Oracle	7891	7656	16172
Access to Mysql	25313	25485	29516
Mysql to Oracle	8047	8140	16672
Oracle to Mysql	26391	26595	32360

In TABLE 2 we show time in millisecond for conversion(e.g. MsAceess to Oracle)with number of table migrate in database. Database contain three table each table having six attribute with 1000 records in it. We can draw a graph with respect to conversion and time required by number of table shown in Figure.3.

TABLE 3 RESULT ANALYSIS 2

Conversion	No. of table		
	1 tables	2 tables	3 tables
Access to Oracle	8124	10032	12234
Access to Mysql	36109	61500	83438
Mysql to Oracle	8187	9767	12546
Oracle to Mysql	36906	62219	84703

Note:

1. Test table contains 1000 records with 6 attributes.
2. Time measured is in milli second.

This graph is for to show time in milli second on y axis and conversion with number of table on x-axis. Graph show variation in time with respective conversion

1. Graph is for 100 records with six columns in it.
2. Graph is for 1000 record with six columns in it.

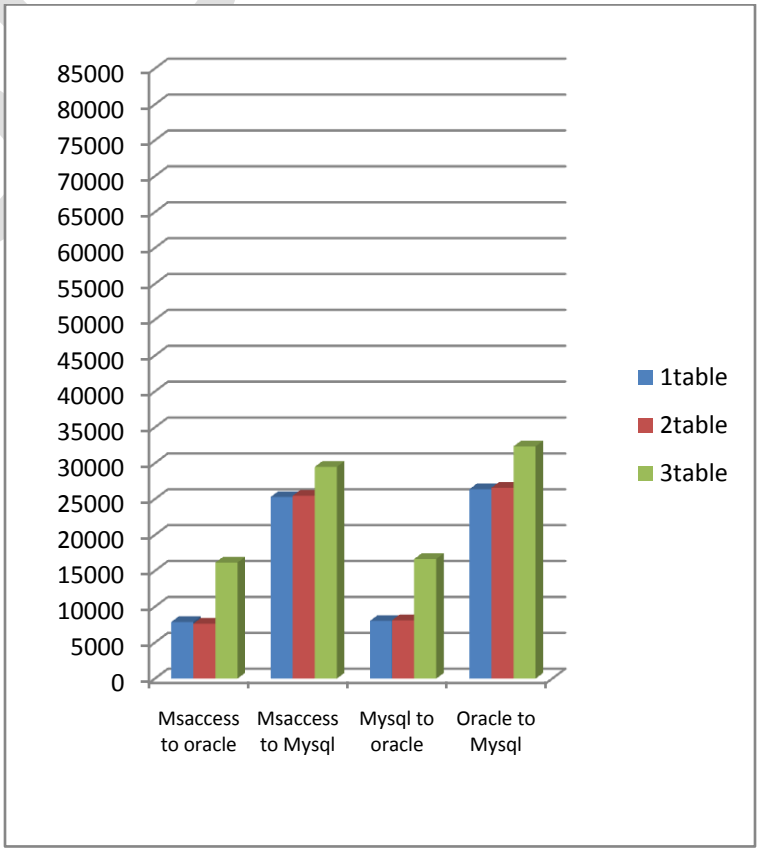

Figure 2 Result Analysis 1

In database migration process first we migrate the structure and fill the data in it. We take an observation one of the structure is prepare in specific time then the records are filled somewhat different time. Not major change in 100, 1000 record tables.

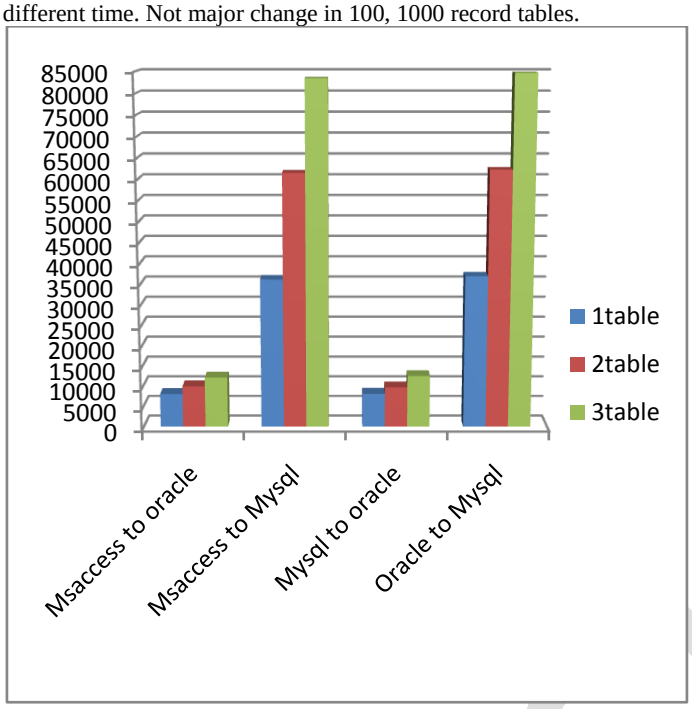

Figure 3 Result Analysis 2

CONCLUSION

Database migration is an extremely large system engineering project, which includes many fields such as database, application program, performance tuning and test; and it has a wide application. Choosing a suitable DBMS for system extension could reduce update cost dramatically and do great help in the future. This paper is based on database migration project and detailed introduces technique issues of data migration involving manual work, which may contribute to organizations that have data migration demands.

In this paper we take experimental study with time required for various conversion. We take one database contain three table having six attribute and calculate conversion time in millisecond. We study for each table contain 100 record and calculate time. Again each table contain 1000 record and calculate time. We compare for 100 and 1000 records for same table having six attribute. We have seen that, conversion time required for 100 records are slightly different for 1000 records. And conversion time must be depend on system configuration.

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