i2i Systems
innovation to integration

CopyCat
Automated Test Environment Copy Tool

Case Study

Test Environment
Management Solution

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1   EXECUTIVE SUMMARY

Our client is a major mobile telecommunications company, whose shares have been traded on the Istanbul (IMKB) and New York Stock Exchanges (NYSE) since July 11, 2000, operating throughout the Turkey and Europe with 34.1 million subscribers. Company has one of the biggest and effective data warehouse implemented in Turkey. Client's data warehouse has entirely separate production, test and development environments with approximately 60 developers and testers working on these systems.

As having almost 60 individuals working and copying data from production to test environment, our client is thought to have a well-managed test environment. However, this major operator had no Test Environment management tool for their data warehouse and everything was being done manually. Developers and Testers were spending massive amount of time to gather data to test developed codes.

Eventually, this major mobile network operator asked i2i Systems to implement an Automated Test Environment Copy Tool.

2 THE ISSUES

Here are the existing conditions within the organization of our Major client:

- Each tester individually prepares his/her own test data.

- As there is no central data copy software, individuals put extra effort to get data from production.

- Therefore, data preparation phase of Testing takes a long time.

- Same files/tables are being copied several times with different names causing shortage on disk and table space.

- As the manual data copy is the only way from production to test environment. Test environment data are actually the unmasked data from production environment, and that results in information security issues within the company.

- As a result of manual data copy, production and test machines are usually busy during the work hours because minor data copies are scheduled after work hours.

- During data preparation phase, individuals tend to use dummy data because of lack of production data.

- As the test runs are being done with dummy data, most of the unusual cases occur for the first time in production environment when the codes are actually run with the full dataset.

- As a result of tests being run with dummy data, numbers of production defects increases.

3   THE APPROACH

At the beginning, CopyCat was designed to be compatible with Unix/Linux server in which company's main ETL tool worked on. It would copy masked Unix/Linux files that were used and created by ETL tool. Copycat would allow administrators to decide which columns should be masked, and which algorithm should be used to mask these columns. Administrators could also alternate masking key by changing one of the server keys (Actual masking was created from a combination of three different keys. One Random Key from Configurable Database and two keys from customer server.) CopyCat would also automatically alternate masking key in each data copy release.

However, considering the future needs, CopyCat was extended to include data copy from production database environment to the test database environment(including following technologies DB2, SQL Server, Sybase, Axion, Derby/Cloudscape, Firebird, HSQLDB, Interbase, MaxDB/SAPDB, McKoi, MySql, and PostgreSQL etc…). Same design that was mentioned above was also used for databases. In addition to those design patterns, CopyCat would create a copy of a production database in test environment from scratch.

 Here are the main characteristics of CopyCat which was designed for the mobile operator company:

- CopyCat supported data copy from one database to another database with data encryption enabled. It works on multiple database environments such as Oracle, DB2, SQL Server, Sybase, Axion, Derby/Cloudscape, Firebird, HSQLDB, Interbase, MaxDB/SAPDB, McKoi, MySql, and PostgreSQL etc…

- CopyCat allowed users to copy File from one Unix/Linux system to another Unix/Linux system with data encryption.

- CopyCat could also create a database on the test environment and keeps it up-to-date with masked production data.(Oracle specific)

- CopyCat combined three different keys (Random Key from Configurable Database and two keys from customer server) to generate one unique key to mask determined columns of data.

- In order to that, CopyCat merged three different algorithms to create unique CopyCat Algorithm which was used to mask the data.

- CopyCat allowed tool's administrators to alternate/change encryption key in each copy release set.

- CopyCat let users to determine different types of masking styles for each column/delimited text such as Star Masking, X digits of a number, IP Masking, Hashing, Email Addresses, Dates, Phone Numbers, and National ID Numbers.

- CopyCat made User management simpler with an advanced User Based GUI.

4   THE BENEFITS

First of all, CopyCat let Turkish mobile operator to have a stable test environment with the benefits included below:

- Automated Test Database Environment Refreshment with Masked Production Data

- Easily Managed Data According to SOX rules

- Differentiated Production Environment from Test/Dev Environment

- Accelerated Application Testing

- Keep Valuable Customer Information Confidential

- Consistent Test Runs with Masked Production Data

- Quality Test Environment with up-to-date Production Data

- Solved Most of the Problems on Test Environment Related to Disk Space by Reducing the Numbers of the Same Files Being Copied

CopyCat was such an innovative solution for this leader mobile operator that they started to discuss to use CopyCat not only in data warehouse but also other departments.

As the importance of SOX rules increases day by day, CopyCat became a must-to-have product for companies with confidential customer data. CopyCat manages, organizes and copies customer data even right now for Turkey's one of the leader mobile operator. CopyCat can also give your company the edge with advanced development and test phases in the competitive nature of the business.