

简要介绍MS SQL Server 2008上出现的Change Data Capture功能，探讨在Eximbills产品中使用该技术实现Audit Log相关功能的可能途径。

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| Internal reference: | Audit Log Report |

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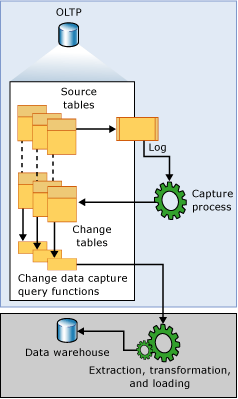
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# 背景描述

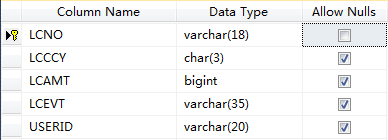
在上两篇报告[《Get Data from DB Log - Oracle.docx》](file:///C:\Users\Administrator\Work\DB%20History%20Data\Get%20Data%20from%20DB%20Log%20-%20Oracle.docx)、《[Get Data From DB Log – DB2](Get%20Data%20from%20DB%20Log%20-%20DB2.docx)》中，介绍了Oracle数据库的Flashback技术及DB2 V10的Time Travel Query功能。利用这些技术，应用程序与报表工具可以直接使用SQL语句读取到数据库中记录的变化历史资料，从而给Audit Log功能的实现提供了便利。

至于MS SQL Server，自2008版本起，推出了一个名为Change Data Capture的功能，同样也是在后台通过读取数据库日志的方法、自动生成数据库中记录的变化历史资料。[这儿](http://msdn.microsoft.com/en-us/library/cc645937.aspx)有相关介绍，当中有一幅图（如下）描述了其基本实现原理。



# 设置步骤

假设在数据库exim下有一个名为dbo.IMLC的表，现有如下几个简单字段——



下面，我们将以此表为基础、分两个步骤设置Change Data Capture——

## Enable Change Data Capture for the Database exim

执行以下Transact-SQL：

USE exim

GO

EXEC sys.sp\_cdc\_enable\_db

GO

## Enable Change Data Capture for the Table IMLC

执行以下Transact-SQL:

USE exim

GO

EXEC sys.sp\_cdc\_enable\_table

@source\_schema = N'dbo',

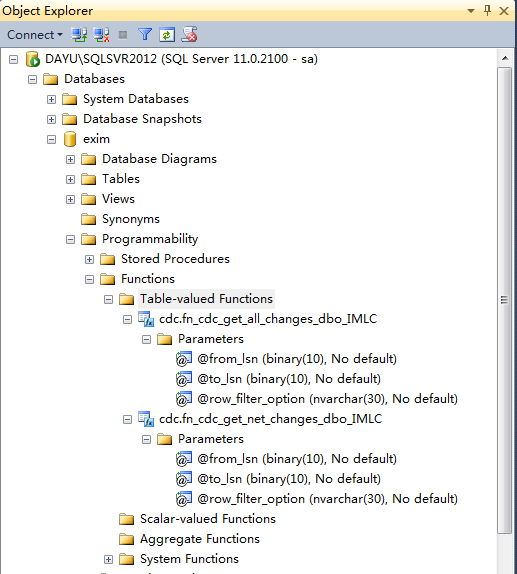
@source\_name = N'IMLC',

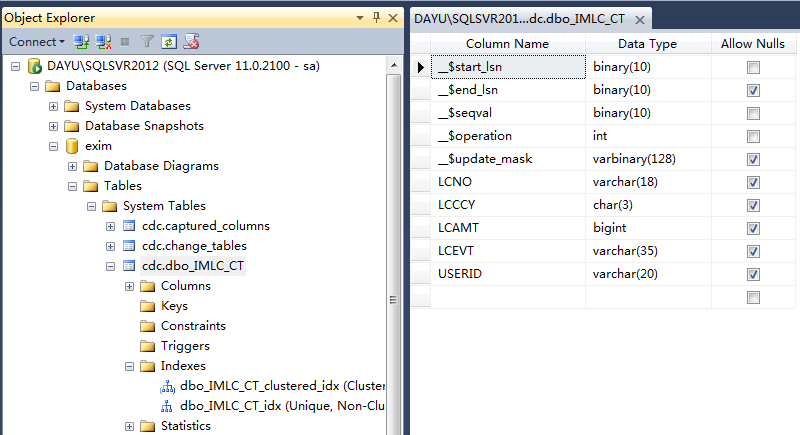
@role\_name = NULL,

@supports\_net\_changes = 1

GO

至此，有关IMLC的Data Change Capture设置就全部完成了，系统还为此自动生成了两个Table-valued函数及一个Change table:





# 验证效果

现在（2012年9月29日），我们对IMLC依次进行如下数据操作：

* Insert一笔记录，LCNO为LC-0001;
* Update上笔记录；
* Delete上笔记录；
* Insert另一笔记录，LCNO为LC-0002.

然后，我们运行如下Transact-SQL：

USE exim;

GO

DECLARE @begin\_time datetime, @end\_time datetime, @from\_lsn binary(10), @to\_lsn binary(10);

-- Obtain the beginning of the time interval.

SET @begin\_time = GETDATE() -1;

-- Obtain the end of the time interval.

SET @end\_time = GETDATE();

-- Map the time interval to a change data capture query range.

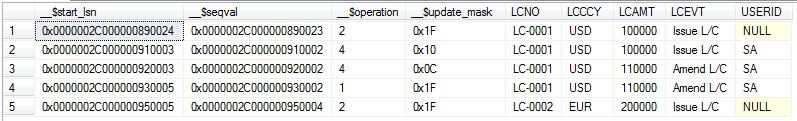
SET @from\_lsn = sys.fn\_cdc\_map\_time\_to\_lsn('smallest greater than or equal', @begin\_time);

SET @to\_lsn = sys.fn\_cdc\_map\_time\_to\_lsn('largest less than or equal', @end\_time);

-- Return the net changes occurring within the query window.

SELECT \* FROM cdc.fn\_cdc\_get\_all\_changes\_dbo\_IMLC(@from\_lsn, @to\_lsn, 'all');

得到的结果如下图：



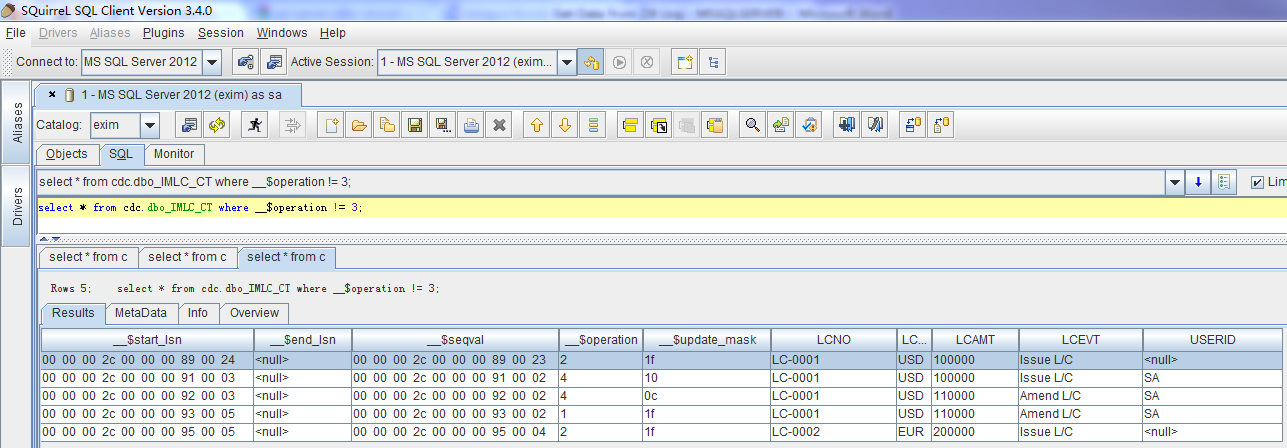
其中，\_\_$operation的值的含义为：

2 – Insert

4 – Update (一次Update产生before/after两笔记录，由\_\_$update\_mask区分)

1 – Delete

此外，通过JDBC/SQL直接访问Change Table也可得到与上面类似的结果：



# 小结

MS SQL Server上的Change Data Capture功能，与Oracle上的Flashback Technology、DB2上的Time Travel Query极其相似，都是只需在数据库上进行一些设置就可打开这些功能；而且，其接口形式都为SQL，故兼容于基于JDBC的各种报表工具，应用方面需要进行的改动也较小，可做为设计Audit Log Report功能的备选方案。

# Sign-off Sheet

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| Internal Reference: |  |
| Version: |  |
| Authors: |  |
| Sign off Required by: |  |

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