

## 文章

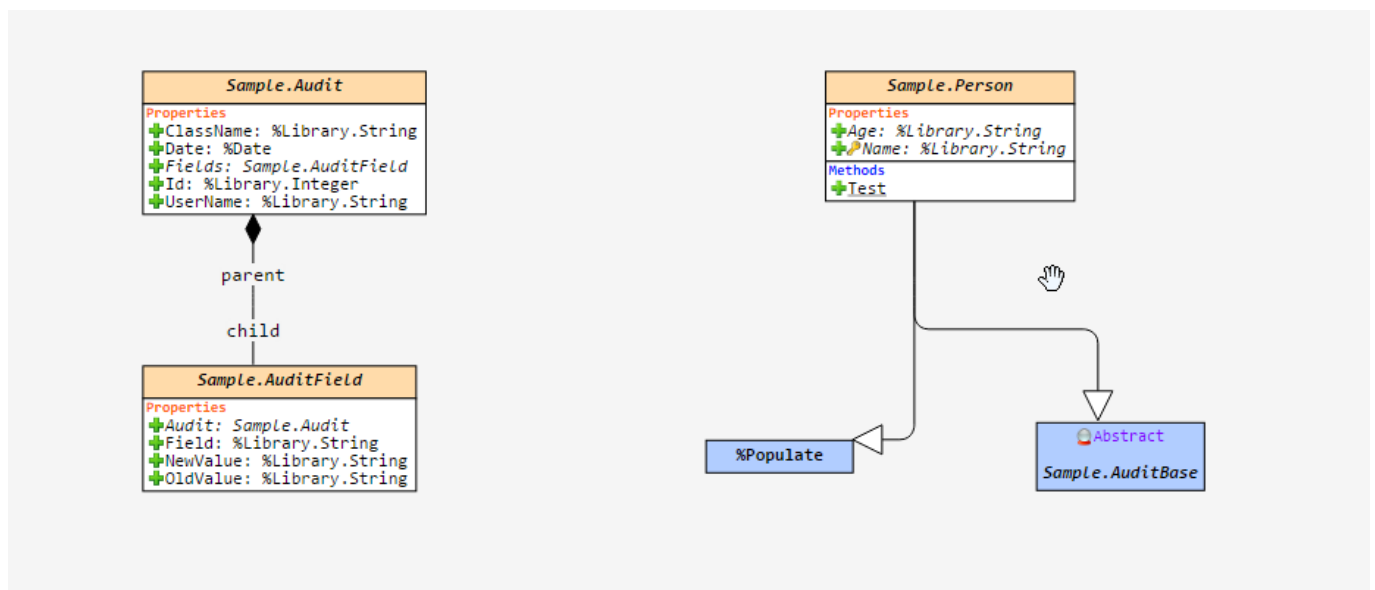
[Michael Lei](#) · 六月 26, 2022 阅读大约需 5 分钟

## 跟踪数据更改 - 审计日志 - 下篇

在[前一篇文章](#)中，我已经演示了一种简单的方法来记录数据的变化。在这个时候，我改变了负责记录审计数据的 "审计抽象类" 和记录审计日志的数据结构。

我已经将数据结构改为父子结构，其中将有两个表来记录 "交易" 和在该交易中改变的 "字段的值"。

看一下新的数据模型：



看看从 "审计类" 改变的代码吧：

```
Class Sample.AuditBase [ Abstract ]
{ Trigger SaveAuditAfter [ CodeMode = objectgenerator, Event = INSERT/UPDATE, Foreach = row/object, Order = 99999, Time = AFTER ]
{
    #dim %compiledclass As %Dictionary.CompiledClass
    #dim tProperty As %Dictionary.CompiledProperty
    #dim tAudit As Sample.Audit Do %code.WriteLine($Char(9)_""; get username and ip adress")
    Do %code.WriteLine($Char(9)_"Set tSC = $$$OK")
    Do %code.WriteLine($Char(9)_"Set tUsername = $USERNAME") Set tKey = ""
    Set tProperty = %compiledclass.Properties.GetNext(tKey)
    Set tClassName = %compiledclass.Name Do %code.WriteLine($Char(9)_"Try {")
    Do %code.WriteLine($Char(9,9)_""; Check if the operation is an update - %oper = UPDATE")
    Do %code.WriteLine($Char(9,9)_"if %oper = ""UPDATE"" {")
    Do %code.WriteLine($Char(9,9,9)_"Set tAudit = ##class(Sample.Audit).%New()")
    Do %code.WriteLine($Char(9,9,9)_"Set tAudit.Date = +$Horolog")
    Do %code.WriteLine($Char(9,9,9)_"Set tAudit.UserName = tUsername")
    Do %code.WriteLine($Char(9,9,9)_"Set tAudit.ClassName = "" _tClassName _ """)
    Do %code.WriteLine($Char(9,9,9)_"Set tAudit.Id = {id}")
    Do %code.WriteLine($Char(9,9,9)_"Set tSC = tAudit.%Save()")
    do %code.WriteLine($Char(9,9,9)_"If $$$ISERR(tSC) $$$ThrowStatus(tSC)")
    Do %code.WriteLine($Char(9,9,9)_"Set tAuditId = tAudit.%Id()") While tKey '="" {
    set tColumnNbr = $Get($$EXTPROPSqlcolumnnumber($$pEXT,%classname,tProperty.Name))
```

```

Set tColumnName = $Get($$$$EXTPROPSqlcolumnname($$$pEXT,%classname,tProperty.Name))
If tColumnNbr = "" { Do %code.WriteLine($Char(9,9,9)_"");
Do %code.WriteLine($Char(9,9,9)_"");
Do %code.WriteLine($Char(9,9,9)_""; Audit Field: "_tProperty.SqlFieldName)
Do %code.WriteLine($Char(9,9,9)_"if {"_tProperty.SqlFieldName _"*C"} {"})
Do %code.WriteLine($Char(9,9,9,9)_"Set tAuditField = ##class(Sample.AuditField).%New()")
Do %code.WriteLine($Char(9,9,9,9)_"Set tAuditField.Field = ""_tColumnName_""")
Do %code.WriteLine($Char(9,9,9,9)_"Set tAuditField.OldValue = {"_tProperty.SqlFieldName_*O}")
Do %code.WriteLine($Char(9,9,9,9)_"Set tAuditField.NewValue = {"_tProperty.SqlFieldName_*N}")
Do %code.WriteLine($Char(9,9,9,9)_"Do tAuditField.AuditSetObjectId(tAuditId)")
Do %code.WriteLine($Char(9,9,9,9)_"Set tSC = tAuditField.%Save()")
do %code.WriteLine($Char(9,9,9,9)_"If $$$ISERR(tSC) $$$ThrowStatus(tSC)")
Do %code.WriteLine($Char(9,9,9)_"}")
}
Set tProperty = %compiledclass.Properties.GetNext(tKey)
} Do %code.WriteLine($Char(9,9,9)_"}") Do %code.WriteLine($Char(9)_) Catch (tException) {"")
Do %code.WriteLine($Char(9,9)_"Set %msg = tException.AsStatus()")
Do %code.WriteLine($Char(9,9)_"Set %ok = 0")
Do %code.WriteLine($Char(9)_) Set %ok = 1
}}

```

通过Test()类方法改变数据，现在你可以看到审计类（Sample.Audit）中的 "父记录"和 "审计字段"类中的 "子字段"被改变。（Sample.AuditField）。

```
d ##class(Sample.Person).Test(1)
```

```
INSERT INTO Sample.Person (Name, Age) VALUES ('TEST PARENT-CHILD', '01')
```

```
SQLCODE: 0
```

```
ID Age Name
```

```
1 01 TEST PARENT-CHILD 1 Rows(s) Affected
```

```
UPDATE Sample.Person SET Name = 'INTERSYSTEMS DEVELOPER COMMUNITY', Age = '100' WHERE Name = 'TEST PARENT-CHILD'
```

```
SQLCODE:0
```

```
ID Age Name
```

```
1 100 INTERSYSTEMS DEVELOPER COMMUNITY 1 Rows(s) Affected
```

审计类:

The screenshot shows the InterSystems Ensemble SQL interface. The left pane displays the database schema with the 'Sample.Audit' table selected. The right pane shows the 'Execute Query' tab with a SQL statement: `SELECT ID1, ClassName, "Date", Id, UserName FROM Sample.Audit`. Below the query, the execution results are displayed in a table format:

ID1	ClassName	Date	Id	UserName
1	Sample.Person	19/04/2017	1	_SYSTEM

Below the table, it indicates '1 row(s) affected'. The top status bar shows 'Row count: 1 Performance: 0,001 seconds 8 global references 965 lines executed 0 disk read latency (ms) Cached Query: %sqlco.USER.ch14 Last update: 2017-04-19 14:10:36.970 Print'.

Menu

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System > SQL

SQL

Server: SalesEngineer  
User: UnknownUser

Namespace: USER Switch  
Licensed to: ISC Sales Engineering

Instance: ENSEMBLE2017

InterSystems®  
Ensemble

Filter: applies to: All

System: Schema

Tables

- Sample Audit
- Sample.AuditField**
- Sample Person

Views

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Cached Queries

Wizards » Actions » Open Table Documentation »

Catalog Details Execute Query Browse SQL Statements in this Namespace

Execute Show Plan Show History Query Builder Display Mode Max 1000 more

SELECT  
Audit, ID, Field, NewValue, OldValue, childsub  
FROM Sample.AuditField

Row count: 2 Performance: 0.001 seconds 11 global references 1193 lines executed 0 disk read latency (ms) Cached Query: %sqlca.USER.ch15 Last update: 2017-04-19 14:10:56.586 Print

Audit	ID	Field	NewValue	OldValue	childsub
1	1	Age	100	01	1
1	2	Name	INTERSYSTEMS DEVELOPER COMMUNITY: TEST PARENT-CHILD		2

2 row(s) affected

注意Sample.AuditField记录通过Audit字段=1对Sample.Audit类进行了引用。你可以通过使用两个类的关系来查询数据，如下所示：

Menu

Home | About | Help | Logout

System > SQL

SQL

Server: SalesEngineer  
User: UnknownUser

Namespace: USER Switch  
Licensed to: ISC Sales Engineering

Instance: ENSEMBLE2017

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Filter: applies to: All

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Tables

- Sample Audit
- Sample.AuditField**
- Sample Person

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Wizards » Actions » Open Table Documentation »

Catalog Details Execute Query Browse SQL Statements in this Namespace

Execute Show Plan Show History Query Builder Display Mode Max 1000 more

SELECT Audit->ClassName, Audit->Id, Audit->UserName, NewValue, OldValue  
FROM Sample.AuditField

Row count: 2 Performance: 0.001 seconds 13 global references 1035 lines executed 0 disk read latency (ms) Cached Query: %sqlca.USER.ch17 Last update: 2017-04-19 14:21:18.371 Print

ClassName	Id	UserName	NewValue	OldValue
Sample Person	1	_SYSTEM	100	01
Sample Person	1	_SYSTEM	INTERSYSTEMS DEVELOPER COMMUNITY: TEST PARENT-CHILD	

2 row(s) affected

这样就搞定了。这样，我们有一个不同的审计日志数据结构。

[#对象数据模型](#) [#ObjectScript](#) [#Caché](#) [#InterSystems IRIS for Health](#)

源

URL:

<https://cn.community.intersystems.com/post/%E8%B7%9F%E8%B8%AA%E6%95%B0%E6%8D%AE%E6%9B%B4%E6%94%B9-%E5%AE%A1%E8%AE%A1%E6%97%A5%E5%BF%97-%E4%B8%8B%E7%AF%87>