

Expressions

Using expressions in packages



Overview

- Expression Builder
- SSIS Expression Language Syntax
- Variables
- Expression Usage

Expression Builder

The screenshot shows the 'Expression Builder' dialog box with the following components and annotations:

- Variables Or Columns:** A list of system and user variables on the left, including System::OfflineMode, System::PackageID, System::PackageName, User::RowCount, User::SourceTable, User::SQLSource, System::StartTime, User::TargetTable, System::UserName, System::VersionBuild, System::VersionComments, System::VersionGUID, System::VersionMajor, and System::VersionMinor. A red arrow points to this list from the label 'Variables Or Columns'.
- Available Functions:** A list of function categories on the right, including Mathematical Functions, String Functions, Date/Time Functions (highlighted), NULL Functions, Type Casts, and Operators. A red arrow points to this list from the label 'Available Functions'.
- Expression Construction:** A text area containing the SQL expression: `"INSERT INTO BatchLog (BatchID, BatchDate, TargetTable, BatchStatus) values (?, " + (DT_STR, 255, 1252) GETDATE() + ", ?, 'Inserted " + (DT_STR, 255, 1252) @[User::RowCount] + " records from " + @[User::SourceTable] + ")"`. A red arrow points to this area from the label 'Expression Construction'.
- Expression Evaluation:** A text area showing the evaluated value: `INSERT INTO BatchLog (BatchID, BatchDate, TargetTable, BatchStatus) values (?, 2008-05-21 13:55:26.397000000, ?, 'Inserted 0 records from 'SalesOrderHeader')`. A red arrow points to this area from the label 'Expression Evaluation'.

Buttons at the bottom include 'Evaluate Expression', 'OK', and 'Cancel'.

SSIS Expression Language Syntax

■ Mathematical

- `fx ABS(«numeric_expression»)`
- `fx CEILING(«numeric_expression»)`
- `fx EXP(«numeric_expression»)`
- `fx FLOOR(«numeric_expression»)`
- `fx LN(«numeric_expression»)`
- `fx LOG(«numeric_expression»)`
- `fx POWER(«numeric_expression», «power»)`
- `fx ROUND(«numeric_expression», «length»)`
- `fx SIGN(«numeric_expression»)`
- `fx SQUARE(«numeric_expression»)`
- `fx SQRT(«numeric_expression»)`

■ String










- `fx CODEPOINT(«character_expression»)`
- `fx FINDSTRING(«character_expression», «string», «occurrence»)`
- `fx HEX(«integer_expression»)`
- `fx LEN(«character_expression»)`
- `fx LOWER(«character_expression»)`
- `fx LTRIM(«character_expression»)`
- `fx REPLACE(«character_expression», «search_expression», «replace_expression»)`
- `fx REPLICATE(«character_expression», «times»)`
- `fx REVERSE(«character_expression»)`
- `fx RIGHT(«character_expression», «number»)`
- `fx RTRIM(«character_expression»)`
- `fx SUBSTRING(«character_expression», «start», «length»)`
- `fx TRIM(«character_expression»)`
- `fx UPPER(«character_expression»)`
















■ Date/Time

- `fx DATEADD(«datepart», «number», «date»)`
- `fx DATEDIFF(«datepart», «startdate», «enddate»)`
- `fx DATEPART(«datepart», «date»)`
- `fx DAY(«date»)`
- `fx GETDATE()`
- `fx GETUTCDATE()`
- `fx MONTH(«date»)`
- `fx YEAR(«date»)`






























SSIS Expression Language Syntax

■ NULL Functions

-  ISNULL(«expression»)
-  NULL(DT_I1)
-  NULL(DT_I2)
-  NULL(DT_I4)
-  NULL(DT_I8)
-  NULL(DT_UI1)
-  NULL(DT_UI2)
-  NULL(DT_UI4)
-  NULL(DT_UI8)
-  NULL(DT_R4)
-  NULL(DT_R8)
-  NULL(DT_STR, «length», «code_page»)
-  NULL(DT_WSTR, «length»)
-  NULL(DT_DATE)
-  NULL(DT_BOOL)























-  NULL(DT_NUMERIC, «precision», «scale»)
-  NULL(DT_DECIMAL, «scale»)
-  NULL(DT_CY)
-  NULL(DT_GUID)
-  NULL(DT_BYTES, «length»)
-  NULL(DT_DBDATE)
-  NULL(DT_DBTIME)
-  NULL(DT_DBTIME2, «scale»)
-  NULL(DT_DBTIMESTAMP)
-  NULL(DT_DBTIMESTAMP2, «scale»)
-  NULL(DT_DBTIMESTAMPOFFSET, «scale»)
-  NULL(DT_FILETIME)
-  NULL(DT_IMAGE)
-  NULL(DT_TEXT, «code_page»)
-  NULL(DT_NTEXT)

■ Type Casts

-  (DT_I1)
-  (DT_I2)
-  (DT_I4)
-  (DT_I8)
-  (DT_UI1)
-  (DT_UI2)
-  (DT_UI4)
-  (DT_UI8)
-  (DT_R4)
-  (DT_R8)
-  (DT_STR, «length», «code_page»)
-  (DT_WSTR, «length»)
-  (DT_DATE)
-  (DT_BOOL)
-  (DT_NUMERIC, «precision», «scale»)
-  (DT_DECIMAL, «scale»)
-  (DT_CY)
-  (DT_GUID)
-  (DT_BYTES, «length»)
-  (DT_DBDATE)
-  (DT_DBTIME)
-  (DT_DBTIME2, «scale»)
-  (DT_DBTIMESTAMP)
-  (DT_DBTIMESTAMP2, «scale»)
-  (DT_DBTIMESTAMPOFFSET, «scale»)
-  (DT_FILETIME)
-  (DT_IMAGE)
-  (DT_TEXT, «code_page»)
-  (DT_NTEXT)

SSIS Expression Language Syntax

■ Operators

-  + (Add)
-  + (Concatenate)
-  - (Subtract)
-  - (Negate)
-  * (Multiply)
-  / (Divide)
-  % (Modulo)
-  () (Parentheses)
-  == (Equal)
-  != (Unequal)
-  > (Greater Than)
-  < (Less Than)
-  >= (Greater Than or Equal To)
-  <= (Less Than or Equal To)
-  && (Logical AND)
-  || (Logical OR)
-  ? : (Conditional)
-  & (Bitwise AND)
-  | (Bitwise Inclusive OR)
-  ^ (Bitwise Exclusive OR)
-  ~ (Bitwise Not)
-  ! (Logical Not)

■ Concatenation

```
"StringA " + " string B "
```

■ Conditional Expression

```
IsNull([NumericColumn] ? 0 : [NumericColumn])
```

■ Variable Reference

```
@[User::MyVariable]
```

■ Column Reference

```
[My Column]
```


Variables

Variable Type Description

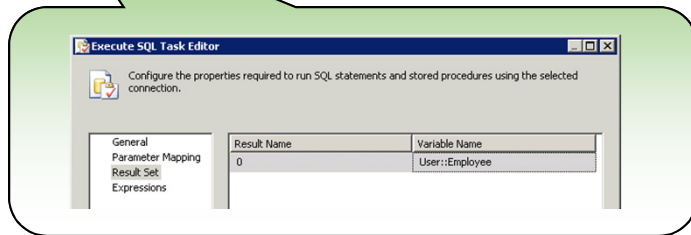
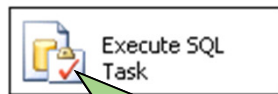
System Package stores values collected during execution (read only)

User Package assigns initial value from hard-coded value or external source and updates value during execution

Name	Scope	Data Type	Value
<input checked="" type="checkbox"/> CancelEvent	Package1	Int32	0
<input checked="" type="checkbox"/> ContainerStartTime	Package1	DateTime	3/9/2011 3:35 PM
<input checked="" type="checkbox"/> CreationDate	Package1	DateTime	5/28/2008 11:00 AM
<input checked="" type="checkbox"/> CreatorComputerName	Package1	String	D101
<input checked="" type="checkbox"/> CreatorName	Package1	String	DATAINSPIRATION\smisner
<input checked="" type="checkbox"/> ExecutionInstanceGUID	Package1	String	{3E030636-9588-4EE9-8F83-A36B539607E8}
<input checked="" type="checkbox"/> FailedConfigurations	Package1	String	
<input checked="" type="checkbox"/> InteractiveMode	Package1	Boolean	False
<input checked="" type="checkbox"/> LastModifiedProductVersion	Package1	String	10.50.1600.1
<input checked="" type="checkbox"/> LocaleID	Package1	Int32	English (United States)
<input checked="" type="checkbox"/> MachineName	Package1	String	D106
<input checked="" type="checkbox"/> OfflineMode	Package1	Boolean	False
<input checked="" type="checkbox"/> PackageID	Package1	String	{C43E923A-D1B0-4C0E-A362-DEF0A85E638C}
<input checked="" type="checkbox"/> PackageName	Package1	String	Package1
<input checked="" type="checkbox"/> ParentContainerGUID	Package1	String	
<input checked="" type="checkbox"/> ProductVersion	Package1	String	10.50.1600.1
<input checked="" type="checkbox"/> StartTime	Package1	DateTime	3/9/2011 3:35 PM
<input checked="" type="checkbox"/> UserName	Package1	String	DATAINSPIRATION\smisner
<input checked="" type="checkbox"/> Employee	Package1	Object	System.Object
<input checked="" type="checkbox"/> VersionBuild	Package1	Int32	2
<input checked="" type="checkbox"/> VersionComments	Package1	String	
<input checked="" type="checkbox"/> VersionGUID	Package1	String	{92BA94BB-EC0B-4705-9DD1-823152692040}
<input checked="" type="checkbox"/> VersionMajor	Package1	Int32	1
<input checked="" type="checkbox"/> VersionMinor	Package1	Int32	0

Variables are case sensitive!

Variables

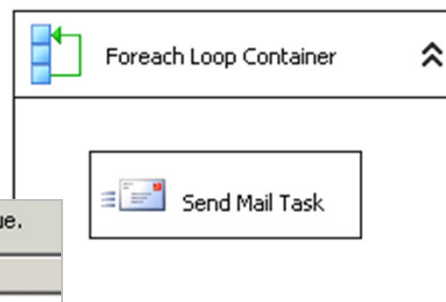


Employee

	EmailAddress	FirstName	TotalSales
1	amy0@adventure-works.com	Amy	732078.4446
2	david8@adventure-works.com	David	3729945.3501
3	garrett1@adventure-works.com	Garrett	3609447.2163

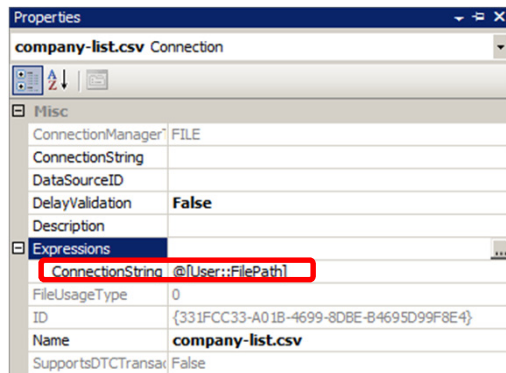
Select variables to map to the collection value.

Variable	Index
User::Email	0
User::Name	1

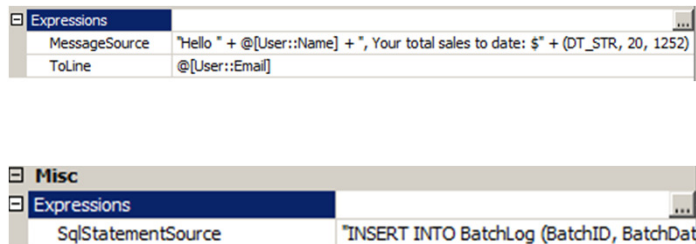


Expression Usage

- Connection Managers



- Task or container properties



```
"INSERT INTO BatchLog
(BatchID, BatchDate,
TargetTable, BatchStatus)
values ("
+ (DT_STR, 255, 1252)
@[User::BatchID]
+ " , convert(datetime, ''
+ substring((DT_WSTR, 50)
GETDATE(),1,10) + '' ), ''
+ @[User::TargetTable]
+ ''', 'Inserted "
+ (DT_STR, 255, 1252)
@[User::RowCount]
+ " records from "
+ @[User::SourceTable]
+ ''')"
```

Expression Usage

- Precedence constraints

Constraint options

Evaluation operation:

Value:

Expression:

- Data transformation properties

Derived C...	Derived ...	Expression
FullName	<add as...	LastName + ", " + FirstName + (ISNULL(MiddleName) ? "" : " " + MiddleName)

Summary

- **Expression Builder**
 - Variables, columns, functions, Evaluate Expression button
- **SSIS Expression Language Syntax**
 - Functions: mathematical, string, date/time, NULL, type casts
 - Operations: concatenation, conditions, variable and column references
- **Variables**
 - System, user
- **Expression Usage**
 - Variables, connection managers, control flow, data flow

References

- **Using Expressions in Packages**
 - <http://msdn.microsoft.com/en-us/library/ms137547.aspx>
- **Integration Services Data Types**
 - <http://msdn.microsoft.com/en-us/library/ms141036.aspx>
- **Integration Services Variables**
 - <http://msdn.microsoft.com/en-us/library/ms141085.aspx>