SQL Server 2005 Books Online (November 2008)

**SQL Server 2005 Data Types (Transact-SQL)**

In SQL Server 2005, each column, local variable, expression, and parameter has a related data type. A data type is an attribute that specifies the type of data that the object can hold: integer data, character data, monetary data, date and time data, binary strings, and so on.

SQL Server supplies a set of system data types that define all the types of data that can be used with SQL Server. You can also define your own data types in Transact-SQL or the Microsoft .NET Framework. Alias data types are based on the system-supplied data types. For more information about alias data types, see [Working with Alias Data Types](http://msdn.microsoft.com/en-us/library/ms189283(SQL.90).aspx). User-defined types obtain their characteristics from the methods and operators of a class that you create by using one of the programming languages support by the .NET Framework. For more information, see [Working with CLR User-defined Types](http://msdn.microsoft.com/en-us/library/ms186366(SQL.90).aspx).

When two expressions that have different data types, collations, precision, scale, or length are combined by an operator, the characteristics of result are determined by the following:

* The data type of the result is determined by applying the rules of data type precedence to the data types of the input expressions. For more information, see [Data Type Precedence (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms190309(SQL.90).aspx).
* The collation of the result is determined by the rules of collation precedence when the result data type is **char**, **varchar**, **text**, **nchar**, **nvarchar**, or **ntext**. For more information, see [Collation Precedence (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms179886(SQL.90).aspx).
* The precision, scale, and length of the result depend on the precision, scale, and length of the input expressions. For more information, see [Precision, Scale, and Length (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms190476(SQL.90).aspx).

SQL Server 2005 provides data type synonyms for SQL-92 compatibility. For more information, see [Data Type Synonyms (Transact-SQL)](http://msdn.microsoft.com/en-us/library/ms177566(SQL.90).aspx).

http://i.msdn.microsoft.com/Global/Images/clear.gif Data Type Categories

Data types in SQL Server 2005 are organized into the following categories:

|  |  |
| --- | --- |
| Exact numerics | Unicode character strings |
| Approximate numerics | Binary strings |
| Date and time | Other data types |
| Character strings |  |

In SQL Server 2005, based on their storage characteristics, some data types are designated as belonging to the following groups:

* Large value data types: **varchar(max)**, **nvarchar(max)**, and **varbinary(max)**
* Large object data types: **text**, **ntext**, **image**, **varchar(max)**, **nvarchar(max)**, **varbinary(max)**, and **xml**

|  |
| --- |
| **ms187752.note(en-US,SQL.90).gifNote:** |
| **sp\_help** returns -1 as the length for the large-value and **xml** data types. |

**Exact Numerics**

|  |  |
| --- | --- |
| [bigint](http://msdn.microsoft.com/en-us/library/ms187745(SQL.90).aspx) | [decimal](http://msdn.microsoft.com/en-us/library/ms187746(SQL.90).aspx) |
| [int](http://msdn.microsoft.com/en-us/library/ms187745(SQL.90).aspx) | [numeric](http://msdn.microsoft.com/en-us/library/ms187746(SQL.90).aspx) |
| [smallint](http://msdn.microsoft.com/en-us/library/ms187745(SQL.90).aspx) | [money](http://msdn.microsoft.com/en-us/library/ms179882(SQL.90).aspx) |
| [tinyint](http://msdn.microsoft.com/en-us/library/ms187745(SQL.90).aspx) | [smallmoney](http://msdn.microsoft.com/en-us/library/ms179882(SQL.90).aspx) |
| [bit](http://msdn.microsoft.com/en-us/library/ms177603(SQL.90).aspx) |  |

**Approximate Numerics**

|  |  |
| --- | --- |
| [float](http://msdn.microsoft.com/en-us/library/ms173773(SQL.90).aspx) | [real](http://msdn.microsoft.com/en-us/library/ms173773(SQL.90).aspx) |

**Date and Time**

|  |  |
| --- | --- |
| [datetime](http://msdn.microsoft.com/en-us/library/ms187819(SQL.90).aspx) | [smalldatetime](http://msdn.microsoft.com/en-us/library/ms187819(SQL.90).aspx) |

**Character Strings**

|  |  |
| --- | --- |
| [char](http://msdn.microsoft.com/en-us/library/ms176089(SQL.90).aspx) | [text](http://msdn.microsoft.com/en-us/library/ms187727(SQL.90).aspx) |
| [varchar](http://msdn.microsoft.com/en-us/library/ms176089(SQL.90).aspx) - [varchar](http://msdn.microsoft.com/en-us/library/ms176089(SQL.90).aspx)(max) - New in SQL Server 2005 |  |

**Unicode Character Strings**

|  |  |
| --- | --- |
| [nchar](http://msdn.microsoft.com/en-us/library/ms186939(SQL.90).aspx) | [ntext](http://msdn.microsoft.com/en-us/library/ms187993(SQL.90).aspx) |
| [nvarchar](http://msdn.microsoft.com/en-us/library/ms186939(SQL.90).aspx) - [nvarchar](http://msdn.microsoft.com/en-us/library/ms176089(SQL.90).aspx)(max) - New in SQL Server 2005 |  |

**Binary Strings**

|  |  |
| --- | --- |
| [binary](http://msdn.microsoft.com/en-us/library/ms188362(SQL.90).aspx) | [image](http://msdn.microsoft.com/en-us/library/ms174409(SQL.90).aspx) |
| [varbinary](http://msdn.microsoft.com/en-us/library/ms188362(SQL.90).aspx) - [varbinary](http://msdn.microsoft.com/en-us/library/ms188362(SQL.90).aspx) (max) - New in SQL Server 2005 |  |

**Other Data Types**

|  |  |
| --- | --- |
| [cursor](http://msdn.microsoft.com/en-us/library/ms190498(SQL.90).aspx) | [timestamp](http://msdn.microsoft.com/en-us/library/ms182776(SQL.90).aspx) |
| [sql\_variant](http://msdn.microsoft.com/en-us/library/ms173829(SQL.90).aspx) | [uniqueidentifier](http://msdn.microsoft.com/en-us/library/ms187942(SQL.90).aspx) |
| [table](http://msdn.microsoft.com/en-us/library/ms175010(SQL.90).aspx) | [xml](http://msdn.microsoft.com/en-us/library/ms187339(SQL.90).aspx) - New in SQL Server 2005 |

<http://media.wiley.com/product_data/excerpt/57/07645775/0764577557.pdf>

New datatypes

SQL Server 2005 supports several new datatypes:

\_ **varchar(max):** This allows you to use sequences of characters greater than 8000 bytes (8000 characters). The maximum size is 2GB.

\_ **nvarchar(max):** This allows you to use sequences of Unicode characters greater than 8000 bytes (4000 characters). The maximum size is 2GB.

\_ **varbinary(max):** This allows you to use binary data greater than 8000bytes.

Each of the preceding datatypes can be up to 2GB in size. This allows major size increases in size compared to varchar(8000) and nvarchar(8000),

which were each limited to 8K.