**Data Types (Transact-SQL)**

**SQL Server 2008 R2**

[Other Versions](javascript:;)

Description: http://i.technet.microsoft.com/Areas/Epx/Content/Images/ImageSprite.png

* [SQL Server 2008](http://technet.microsoft.com/en-us/library/ms187752(d=printer,v=sql.100).aspx)
* [SQL Server 2005](http://technet.microsoft.com/en-us/library/ms187752(d=printer,v=sql.90).aspx)
* [SQL Server 2012](http://technet.microsoft.com/en-us/library/ms187752(d=printer,v=sql.110).aspx)

In SQL Server, 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://technet.microsoft.com/en-us/library/ms189283(v=sql.105).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://technet.microsoft.com/en-us/library/ms186366(v=sql.105).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://technet.microsoft.com/en-us/library/ms190309(v=sql.105).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://technet.microsoft.com/en-us/library/ms179886(v=sql.105).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://technet.microsoft.com/en-us/library/ms190476(v=sql.105).aspx).

SQL Server provides data type synonyms for ISO compatibility. For more information, see [Data Type Synonyms (Transact-SQL)](http://technet.microsoft.com/en-us/library/ms177566(v=sql.105).aspx).

[Data Type Categories](javascript:void(0))

Data types in SQL Server 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, 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

|  |
| --- |
| **Note** |
| sp\_help returns -1 as the length for the large-value and xml data types. |

**Exact Numerics**

|  |  |
| --- | --- |
| [bigint](http://technet.microsoft.com/en-us/library/ms187745(v=sql.105).aspx) | [numeric](http://technet.microsoft.com/en-us/library/ms187746(v=sql.105).aspx) |
| [bit](http://technet.microsoft.com/en-us/library/ms177603(v=sql.105).aspx) | [smallint](http://technet.microsoft.com/en-us/library/ms187745(v=sql.105).aspx) |
| [decimal](http://technet.microsoft.com/en-us/library/ms187746(v=sql.105).aspx) | [smallmoney](http://technet.microsoft.com/en-us/library/ms179882(v=sql.105).aspx) |
| [int](http://technet.microsoft.com/en-us/library/ms187745(v=sql.105).aspx) | [tinyint](http://technet.microsoft.com/en-us/library/ms187745(v=sql.105).aspx) |
| [money](http://technet.microsoft.com/en-us/library/ms179882(v=sql.105).aspx) |  |

**Approximate Numerics**

|  |  |
| --- | --- |
| [float](http://technet.microsoft.com/en-us/library/ms173773(v=sql.105).aspx) | [real](http://technet.microsoft.com/en-us/library/ms173773(v=sql.105).aspx) |

**Date and Time**

|  |  |
| --- | --- |
| [date](http://technet.microsoft.com/en-us/library/bb630352(v=sql.105).aspx) | [datetimeoffset](http://technet.microsoft.com/en-us/library/bb630289(v=sql.105).aspx) |
| [datetime2](http://technet.microsoft.com/en-us/library/bb677335(v=sql.105).aspx) | [smalldatetime](http://technet.microsoft.com/en-us/library/ms182418(v=sql.105).aspx) |
| [datetime](http://technet.microsoft.com/en-us/library/ms187819(v=sql.105).aspx) | [time](http://technet.microsoft.com/en-us/library/bb677243(v=sql.105).aspx) |

**Character Strings**

|  |  |
| --- | --- |
| [char](http://technet.microsoft.com/en-us/library/ms176089(v=sql.105).aspx) | [varchar](http://technet.microsoft.com/en-us/library/ms176089(v=sql.105).aspx) |
| [text](http://technet.microsoft.com/en-us/library/ms187727(v=sql.105).aspx) |  |

**Unicode Character Strings**

|  |  |
| --- | --- |
| [nchar](http://technet.microsoft.com/en-us/library/ms186939(v=sql.105).aspx) | [nvarchar](http://technet.microsoft.com/en-us/library/ms186939(v=sql.105).aspx) |
| [ntext](http://technet.microsoft.com/en-us/library/ms187993(v=sql.105).aspx) |  |

**Binary Strings**

|  |  |
| --- | --- |
| [binary](http://technet.microsoft.com/en-us/library/ms188362(v=sql.105).aspx) | [varbinary](http://technet.microsoft.com/en-us/library/ms188362(v=sql.105).aspx) |
| [image](http://technet.microsoft.com/en-us/library/ms174409(v=sql.105).aspx) |  |

**Other Data Types**

|  |  |
| --- | --- |
| [cursor](http://technet.microsoft.com/en-us/library/ms190498(v=sql.105).aspx) | [timestamp](http://technet.microsoft.com/en-us/library/ms182776(v=sql.105).aspx) |
| [hierarchyid](http://technet.microsoft.com/en-us/library/bb677290(v=sql.105).aspx) | [uniqueidentifier](http://technet.microsoft.com/en-us/library/ms187942(v=sql.105).aspx) |
| [sql\_variant](http://technet.microsoft.com/en-us/library/ms173829(v=sql.105).aspx) | [xml](http://technet.microsoft.com/en-us/library/ms187339(v=sql.105).aspx) |
| [table](http://technet.microsoft.com/en-us/library/ms175010(v=sql.105).aspx) |  |