

How-To Guide

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How to Convert SQL from the Microsoft SQL Server Database to the SAP HANA™ Database

All Countries



Typographic Conventions

Type Style	Description
<i>Example</i>	Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options. Textual cross-references to other documents.
Example	Emphasized words or expressions.
EXAMPLE	Technical names of system objects. These include report names, program names, transaction codes, table names, and key concepts of a programming language when they are surrounded by body text, for example, SELECT and INCLUDE.
Example	Output on the screen. This includes file and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools.
Example	Exact user entry. These are words or characters that you enter in the system exactly as they appear in the documentation.
<Example>	Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.
EXAMPLE	Keys on the keyboard, for example, F2 or ENTER.

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1 Introduction

This guide describes how to convert structured query language (SQL) in the Microsoft SQL Server database (using T-SQL grammar) to SQL that can be used in the SAP HANA™ database (using ANSI-SQL grammar).

The SQL converter is a semi-automatic tool that helps convert most of the data-definition language (DDL) and data-manipulation language (DML). After the conversion, you **must** check whether the converted version is correct according to your needs.

This tool supports most of the official T-SQL grammar, and some well-known and widely-used undocumented feature. For more information about the official T-SQL grammar, see the MSDN Library at <http://msdn.microsoft.com/en-us/library>.

If SAP HANA does not support certain SQL, this tool will do the following:

- Find equivalents in the SAP HANA database and convert the SQL
- Delete the SQL in the input file and display relevant comments in the output file
- Leave the SQL in the input file as it is, for example, the WITH statement

As SAP HANA does not support recursion, and the recursion in MS SQL Server is realized with the WITH statement, the SQL converter tool does not support the WITH statement.

Note

If you encounter any issue when using the SQL converter, post the issue to the SAP Community Network at <http://scn.sap.com/community/business-one> for general topics or at <http://scn.sap.com/community/business-one/system-administration> for system-administration topics.

2 Using the SQL Converter

The tool converts the input file (SQL in the Microsoft SQL Server database) to an output file (SQL that you can use in the SAP HANA database).

Note

The SQL converter converts only those SQL that you have run successfully in the Microsoft SQL Server database.

Prerequisites

- You have installed .Net Framework 4.0 or later on the computer on which you want to use the SQL converter.
- You have installed the SAP HANA database client software (32-bit) on the computer on which you want to use the SQL converter. For more information, see *SAP HANA Database – Client Installation Guide* on SAP Help Portal at http://help.sap.com/hana_appliance.

Note

Even if your Microsoft Windows is 64 bit, you must install the 32-bit SAP HANA database client software.

- You have downloaded the SQL converter *.zip* file.
- You have ensured that the SQL you want to convert can run successfully in the Microsoft SQL Server database.

Procedure

1. Extract the SQL converter *.zip* file to anywhere on your computer.
2. In the Microsoft Windows command window, navigate to the SQL converter folder. For more information about Microsoft Windows commands, see the command-line reference in the Microsoft Windows on-line help.
3. Enter **Converter.exe <command-line parameters>**.

If you do not use a certain command-line parameter, the system will run the tool according to the settings you defined for that parameter in the configuration file. Parameters in the command line overwrite the parameters you defined in the configuration file. For more information, see [Configuration File](#) and [Command-Line Parameters](#).

Note

If there are multiple statements in the input file, separate them with a semicolon ";". After the conversion, the converted statements will be listed in the output file according to the original sequence.

For example, the input file is as follows:

```
select CardCode, CardName from OCRD where CardType = 'C';  
select max(DocEntry) from ORDR;
```

After conversion, the output file will be as follows:

```
SELECT "CardCode", "CardName" FROM OCRD WHERE "CardType" = 'C';  
SELECT MAX("DocEntry") FROM ORDR;
```

Result

The defined SQL is converted from T-SQL grammar to ANSI-SQL grammar. You must perform checks on the converted version to ensure that it is correct according to your needs.

2.1 Configuration File

You can use the *Config.txt* file to store parameters that you do not change frequently. However, the parameters in the command line overwrite the parameters you defined in the configuration file. If you do not use a certain command-line parameter, the system runs the tool according to the settings you defined for that parameter in the configuration file.

In the configuration file, explanations for parameters are preceded with *//*.

For more information about the parameters, see [Command-Line Parameters](#).

Note

If the configuration file contains multiple lines or values for the same parameter, the last line or value will be used.

Example

An example of the configuration file is as follows:

```
// If UseCaseFixer=true, DB objects (tables, columns,...) will be verified.  
// If UseCaseFixer=false, DB objects will NOT be verified but the SQL converter will run faster.  
UseCaseFixer=true  
// Case fixer will use the following DB settings:  
DBServer=10.55.178.115:30915  
DBSchema=SBODEMOUS  
DBUser=SYSTEM  
DBPasswd=Manager111  
// End of DB settings for the case fixer  
// Exclude conversion comments from the output file or not  
DisableComments=false  
// Specify names for the input and output files  
InputFile= c:\WorkDir\Ppresentations\HANATranslator_0912\Examples.sql  
OutputFile= c:\WorkDir\Ppresentations\HANATranslator_0912\output.sql  
// Format the output file in clean and professional SQL layout or not  
Formatter=false
```

2.2 Command-Line Parameters

You can use the following parameters in the command line to overwrite those defined in the configuration file. If you do not use a certain command-line parameter, the system runs the tool according to the settings you defined for that parameter in the configuration file.

Command-Line Parameters

Parameter	Equivalent in Configuration File	Description	Example
f	UserCaseFixer	Enables the case fixer to check whether all tables mentioned in the input file exist in the SAP HANA database. The default value is false.	<i>-f</i>
s	DBServer	Address and port number of the SAP HANA database server	<i>-s 10.55.178.115:30915</i>
d	DBSchema	Schema name in the SAP HANA database	<i>-d SBODEMOUS</i>
u	DBUser	User name to log on to the SAP HANA database	<i>-u SYSTEM</i>
p	DBPasswd	User password to log on to the SAP HANA database	<i>-p Manager111</i>
c	DisableComments	Excludes conversion comments from the output file. The default value is false. Conversion comments in the output file explain which statements were converted, and which were not, with reasons.	<i>-c</i>
i	InputFile	Path of the input file	<i>-i c:\HANATranslator_0912\input.sql</i>
o	OutputFile	Path of the output file	<i>-o c:\HANATranslator_0912\output.sql</i>
F	Formatter	Formats the output file in a clean and professional SQL layout. The default value is false.	<i>-F</i>
h	Help (does not exist in the file)	Displays help for command-line parameters	<i>-h</i>
P	Create procedures (does not exist in the file)	Enables automatic creation of stored procedures in case of queries with context dependencies. The default	<i>-P</i>

Parameter	Equivalent in Configuration File	Description	Example
		value is false.	
v	Version (does not exist in the file)	Displays the name and version of the tool	-v

3 Supported Data Types

The following table displays the data types supported by the SQL converter, and their corresponding data types in the SAP HANA database.

Supported Data Type

Data Type Category	Data Type in MS SQL Server Database	Data Type in SAP HANA Database
Exact numerics	bigint	bigint
	bit	tinyint
	decimal	decimal
	int	integer
	numeric	decimal
	smallint	smallint
	smallmoney	smalldecimal
	money	decimal
	tinyint	tinyint
Approximate numerics	float	float
	real	real
Date and time	date	date
	datetime2	timestamp
	datetime	timestamp
	datetimeoffset	SAP HANA does not support this data type.
	smalldatetime	seconddate
	time	time
Character strings	char	char
	varchar	varchar
	text	text
Unicode character strings	nchar	nchar
	nvarchar	nvarchar
	ntext	nclob

Data Type Category	Data Type in MS SQL Server Database	Data Type in SAP HANA Database
Binary strings	binary	binary
	varbinary	varbinary
	image	blob
Other Data Types	cursor	SAP HANA does not support this data type.
	timestamp	timestamp
	hierarchyid	SAP HANA does not support this data type.
	uniqueidentifier	nvarchar
	sql_variant	SAP HANA does not support this data type.
	xml	SAP HANA does not support this data type.
	table	SAP HANA does not support this data type.

4 Supported Operators

The following table displays the operators supported by the SQL converter.

Supported Operators

Operator Category	Operator
Arithmetic operators	+ (add), - (subtract), * (multiply), / (divide)
String operators	(concatenation)
Comparison operators	=, >, <, >=, <=, <>, !=, !<, !>
Assignment operator	=
Bitwise operators	&, , ^
Set operators	union, union all, intersect, except
Logical operators	and, or, not, all, any, between, exists, in, like, some, is null, is not null

5 Supported Expressions

SQL converter supports case expressions and aggregate expressions.

6 Supported SQL Statements

6.1 Supported DML

The following table displays the DML supported by the SQL converter, and related information.

DML	Related Information
Select	In the MS SQL Server database: http://msdn.microsoft.com/en-us/library/ms189499 In the SAP HANA database: http://help.sap.com/hana/html/sql_select.html
Insert	In the MS SQL Server database: http://msdn.microsoft.com/en-us/library/ms174335 In the SAP HANA database: http://help.sap.com/hana/html/sql_insert.html
Update	In the MS SQL Server database: http://msdn.microsoft.com/en-us/library/ms177523 In the SAP HANA database: http://help.sap.com/hana/html/sql_update.html
Delete	In the MS SQL Server database: http://msdn.microsoft.com/en-us/library/ms189835 In the SAP HANA database: http://help.sap.com/hana/html/sql_delete.html

6.2 Supported DDL

The following table displays the DDL supported by the SQL converter, and related information.

DDL	Related Information
Create Table	In the MS SQL Server database: http://msdn.microsoft.com/en-us/library/ms174979 In the SAP HANA database: http://help.sap.com/hana/html/sql_create_table.html
Create Index	In the MS SQL Server database: http://msdn.microsoft.com/en-us/library/ms188783 In the SAP HANA database: http://help.sap.com/hana/html/sql_create_index.html
Create View	In the MS SQL Server database: http://msdn.microsoft.com/en-us/library/ms187956 In the SAP HANA database: http://help.sap.com/hana/html/sql_create_view.html
Alter Table	In the MS SQL Server database: http://msdn.microsoft.com/en-us/library/ms190273 In the SAP HANA database: http://help.sap.com/hana/html/sql_alter_table.html
Alter Index	In the MS SQL Server database: http://msdn.microsoft.com/en-us/library/ms188388 In the SAP HANA database: http://help.sap.com/hana/html/sql_alter_index.html
Drop Table	In the MS SQL Server database: http://msdn.microsoft.com/en-us/library/ms173790 In the SAP HANA database: http://help.sap.com/hana/html/sql_drop_table.html
Drop Index	In the MS SQL Server database: http://msdn.microsoft.com/en-us/library/ms176118

DDL	Related Information
	In the SAP HANA database: http://help.sap.com/hana/html/sql_drop_index.html
Drop View	In the MS SQL Server database: http://msdn.microsoft.com/en-us/library/ms173492 In the SAP HANA database: http://help.sap.com/hana/html/sql_drop_view.html

6.3 Supported Complex Statements

SAP HANA requires that you create stored procedures in case of complex statements, that is, those statements with context dependencies. You can use the command-line parameter `P` to enable automatic creation of stored procedures in case of complex statements. If you do not use this parameter, the complex statements will be converted to separate statements, that is, they will not be wrapped into stored procedures.

The supported complex statements are: While statement, If statement, Declare Variable/Cursor, and Create/Drop/Alter procedure.

Note

Variable is converted to plain text name.

7 Supported Undocumented Feature

SQL converter supports Bracketed types, which are not in the official documentation of T-SQL.

8 Supported Features with Limitation

8.1 Concating Strings

In the T-SQL grammar, the operator "+" is used to concat the strings, while in the ANSI-SQL grammar, the operator "||" is used to concat the strings. In both grammars, the operator "+" is used in arithmetic addition. The following table shows the rules that SQL converter follows for concatng strings.

Rules for Concating Strings

Expression in Input File	Result in Output File
number + number	number + number
number + string	number + string
string + string	string string
All other expressions	operand1 +operand2

8.2 Using Integer Value as DATE Parameter

In the T-SQL grammar, integer values are translated to DATE as follows:

0 = "1900-01-01"

1 = "1900-01-02"

In the ANSI-SQL grammar, there is no implicit translation from integer values to DATE. The SQL converter will convert integer values used in the DATE argument of the procedure as follows:

Integer_Value => ADD_DAYS("1900-01-01 00:00:00.000, Integer_Value)

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