Date and Time Conversions Using SQL Server

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Problem

There are many instances when dates and times don't show up at your doorstep in the format you'd like it to be, nor does the output of a query fit the needs of the people viewing it. One option is to format the data in the application itself. Another option is to use the built-in functions SQL Server provides to format the date string for you.

Solution

SQL Server provides a number of options you can use to format a date/time string. One of the first considerations is the actual date/time needed. The most common is the current date/time using **getdate()**. This provides the current date and time according to the server providing the date and time. If a universal date/time is needed, then **getutcdate()** should be used. To change the format of the date, you convert the requested date to a string and specify the format number corresponding to the format needed.

How to get different SQL Server date formats

1. Use the date format option along with CONVERT function
2. To get YYYY-MM-DD use SELECT CONVERT(varchar, getdate(), 23)
3. To get MM/DD/YYYY use SELECT CONVERT(varchar, getdate(), 1)
4. Check out the chart to get a list of all format options

Below is a list of formats and an example of the output. The date used for all of these examples is "2006-12-30 00:38:54.840".

DATE ONLY FORMATS		
Format #	**Query**	**Sample**
1	select convert(varchar, getdate(), 1)	12/30/06
2	select convert(varchar, getdate(), 2)	06.12.30
3	select convert(varchar, getdate(), 3)	30/12/06
4	select convert(varchar, getdate(), 4)	30.12.06
5	select convert(varchar, getdate(), 5)	30-12-06
6	select convert(varchar, getdate(), 6)	30 Dec 06
7	select convert(varchar, getdate(), 7)	Dec 30, 06

10	select convert(varchar, getdate(), 10)	12-30-06
11	select convert(varchar, getdate(), 11)	06/12/30
12	select convert(varchar, getdate(), 12)	061230
23	select convert(varchar, getdate(), 23)	2006-12-30
101	select convert(varchar, getdate(), 101)	12/30/2006
102	select convert(varchar, getdate(), 102)	2006.12.30
103	select convert(varchar, getdate(), 103)	30/12/2006
104	select convert(varchar, getdate(), 104)	30.12.2006
105	select convert(varchar, getdate(), 105)	30-12-2006
106	select convert(varchar, getdate(), 106)	30 Dec 2006
107	select convert(varchar, getdate(), 107)	Dec 30, 2006
110	select convert(varchar, getdate(), 110)	12-30-2006
111	select convert(varchar, getdate(), 111)	2006/12/30
112	select convert(varchar, getdate(), 112)	20061230
TIME ONLY FORMATS		
8	select convert(varchar, getdate(), 8)	00:38:54
14	select convert(varchar, getdate(), 14)	00:38:54:840
24	select convert(varchar, getdate(), 24)	00:38:54
108	select convert(varchar, getdate(), 108)	00:38:54
114	select convert(varchar, getdate(), 114)	00:38:54:840
DATE & TIME FORMATS		
0	select convert(varchar, getdate(), 0)	Dec 12 2006 12:38AM
9	select convert(varchar, getdate(), 9)	Dec 30 2006 12:38:54:840AM
13	select convert(varchar, getdate(), 13)	30 Dec 2006 00:38:54:840AM
20	select convert(varchar, getdate(), 20)	2006-12-30 00:38:54
21	select convert(varchar, getdate(), 21)	2006-12-30 00:38:54.840
22	select convert(varchar, getdate(), 22)	12/30/06 12:38:54 AM
25	select convert(varchar, getdate(), 25)	2006-12-30 00:38:54.840
100	select convert(varchar, getdate(), 100)	Dec 30 2006 12:38AM
109	select convert(varchar, getdate(), 109)	Dec 30 2006 12:38:54:840AM
113	select convert(varchar, getdate(), 113)	30 Dec 2006 00:38:54:840
120	select convert(varchar, getdate(), 120)	2006-12-30 00:38:54
121	select convert(varchar, getdate(), 121)	2006-12-30 00:38:54.840

126	select convert(varchar, getdate(), 126)	2006-12-30T00:38:54.840
127	select convert(varchar, getdate(), 127)	2006-12-30T00:38:54.840
FORMATS WITH ISSUES		
130	select convert(varchar, getdate(), 130)	10 ?? ????? 1427 12:38:54:840A
131	select convert(varchar, getdate(), 131)	10/12/1427 12:38:54:840AM

You can also format the date or time without dividing characters, as well as concatenate the date and time string:

Sample statement	Output
select replace(convert(varchar, getdate(),101),'/','')	12302006
select replace(convert(varchar, getdate(),101),'/','') + replace(convert(varchar, getdate(),108),':','')	12302006004426

If you want to get a list of all valid date and time formats, you could use the code below and change the @date to GETDATE() or any other date you want to use. This will output just the valid formats.

```
DECLARE @counter INT = 0
DECLARE @date DATETIME = '2006-12-30 00:38:54.840'

CREATE TABLE #dateFormats (dateFormatOption int, dateOutput varchar(40))

WHILE (@counter <= 150 )
BEGIN
   BEGIN TRY
      INSERT INTO #dateFormats
      SELECT CONVERT(varchar, @counter), CONVERT(varchar,@date, @counter)
      SET @counter = @counter + 1
   END TRY
   BEGIN CATCH;
      SET @counter = @counter + 1
      IF @counter >= 150
      BEGIN
         BREAK
      END
   END CATCH
END

SELECT * FROM #dateFormats
```

Next Steps

- The formats listed above are not inclusive of all formats provided. Experiment with the different format numbers to see what others are available.
- These formats can be used for all date/time functions, as well as data being served to clients, so experiment with these data format conversions to see if they can provide data more efficiently.
- Also, check out the SQL Server FORMAT Function to Format Dates.

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About the author

Edgewood Solutions is a technology company focused on Microsoft SQL Server and founder of MSSQLTips.com.
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