Performance Impact Using Different Datatypes Implicit Convert

Last updated by | Holger Linke | Oct 26, 2022 at 1:41 AM PDT

Contents

Symptoms

I would like to share with you an example how may be the impact when our customers are using a different datatype that the column has in a TSQL command.

For example, our customer has the following table definition

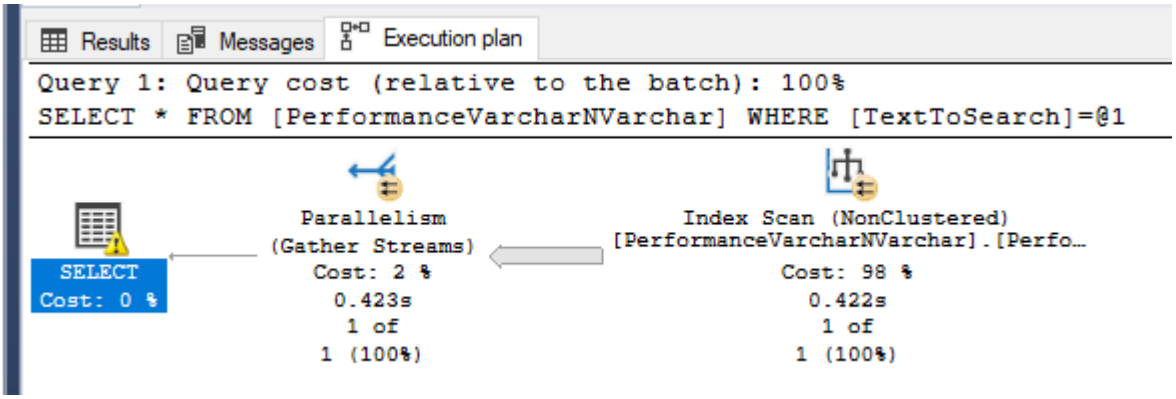
```
CREATE TABLE [dbo].[PerformanceVarcharNVarchar](
        [Id] [int] IDENTITY(1,1) NOT NULL,
        [TextToSearch] [varchar](200) NOT NULL,
 CONSTRAINT [PK_PerformanceVarcharNVarchar] PRIMARY KEY CLUSTERED
(
        [Id] ASC
)WITH (STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]

CREATE NONCLUSTERED INDEX [PerformanceVarcharNVarchar1] ON [dbo].[PerformanceVarcharNVarchar]
(
        [TextToSearch] ASC
)WITH (STATISTICS_NORECOMPUTE = OFF, DROP_EXISTING = OFF, ONLINE = OFF) ON [PRIMARY]
GO
```

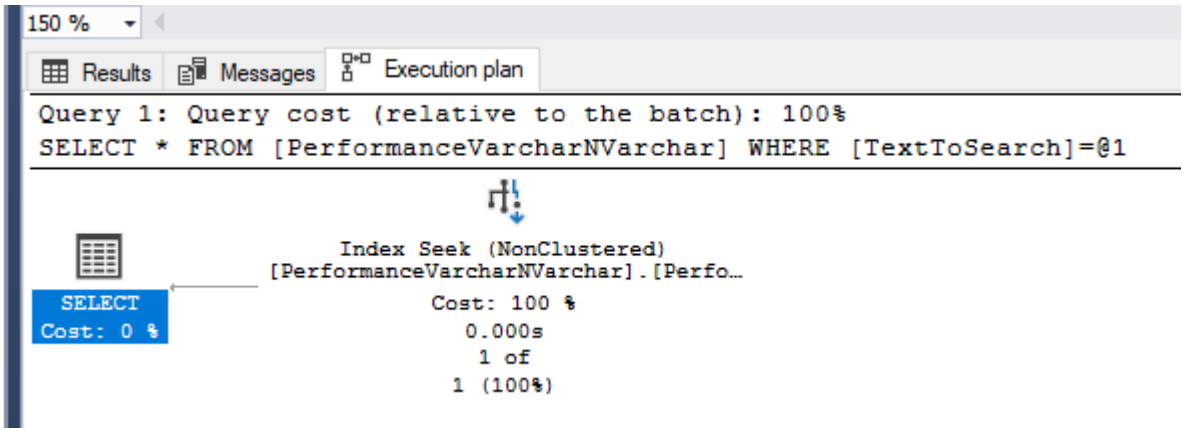
When our customer executes the following query:

```
select * from PerformanceVarcharNVarchar where TextToSearch = N'Example 1'
```

In this example the column in the table is defined as a **varchar(200)** however the select statment passess an **Nvarchar** these two types can't be compared directly so a convert is required. The SQL engine converts the data coming out of the table to match than of the query so varchar -- > nvarchar. This means index seeks are not possible and also has potentially an impact on CPU as performing the convert requires CPU cycles to complete.

As you could see in the following image we have an index scan instead of a index seek, because we have an implicit conversion of datatypes from **nVarchar (Unicode)** to **varchar (column datatype)**. Depending on the resources of the database plus the number of rows to read the impact will be very high.





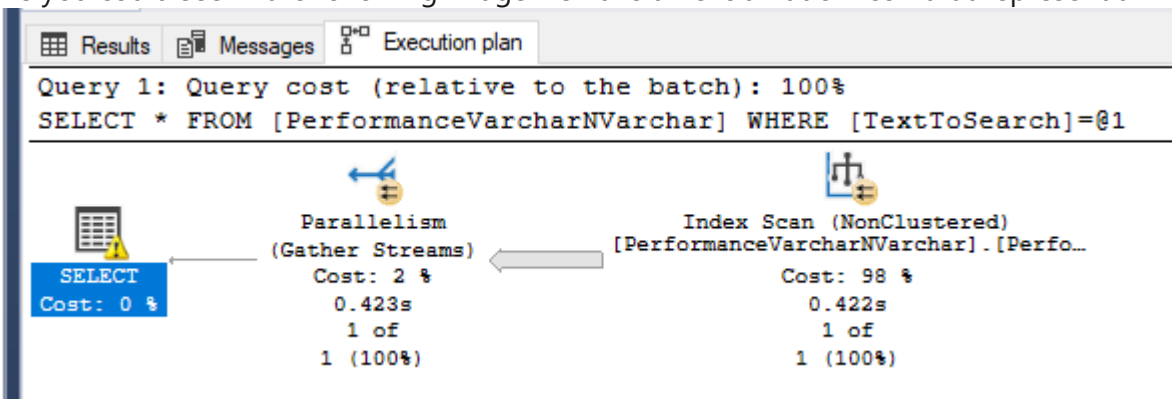
How to find if our customer has a conversion implicit

Using Query Data Store and review the parameters

Using Query Data Store, you could see the parameters types using in every query.

Review the execution plan

As you could see in the following image we have an exclamation icon that represent an implicit conversion.



In the XML plan you may see the following

<ScalarOperator ScalarString="CONVERT_IMPLICIT(nvarchar(200),[Sergey2].[dbo].[PerformanceVarcharNVarchar].[TextToSearch],0)=[@1]">

Additional Information

- Our blog:https://techcommunity.microsoft.com/t5/azure-database-support-blog/lesson-learned-45-cpu-at-100-using-nvarchar-parameter-data-type/ba-p/369047
- Our Mentoring channel on https://supportability.visualstudio.com/AzureSQLDB/_wiki/wikis/AzureSQLDB.wiki/279765/Azure-Databases-Technical-Presentations-and-Triages you could find \dsdb\SQLskills\SQLAzure\EMEA\Azure Database - Readiness Plan FY19 Series\Videos the video Azure Database - Readiness Plan FY19 Series -- Performance Monitoring.mp4 that contains an explanation and workflow to fix this issue.

How good have you found this content?