Slow query due to implicit conversion related to JDBC

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Slow query due to implicit_conversion, related to JDBC configuration property

Issue

The customer has migrated their data from on-premise Oracle to Azure SQL Database and is now experiencing slowness for some queries. While checking the execution plans for the slow queries, it was found that implicit conversions are occurring in relation to parameters in `WHERE` and `JOIN` clauses.

Investigation / Analysis

See article [Slow query due to implicit conversion](#) for more background details about troubleshooting and the impact of implicit conversions.

For this specific scenario, the customer's JDBC application created the parameterized queries that are executed on the database. The application's JDBC driver requests the parameters as `NVARCHAR` whereas the column datatypes in the database tables are defined as `VARCHAR`. Because NVARCHAR has a higher precedence than VARCHAR, the table's column values will be implicitly converted from VARCHAR to NVARCHAR. This is causing a table scan instead of an index operation and thus massive, unneccessary read I/O on the database.

To confirm that this is the same issue as your customer's issue:

1. Capture the query hash and execution plan of the slow queries and check if there are implicit conversions for the `NVARCHAR` data type
2. Check the XML config file for the JDBC driver on the client side to make sure that property `sendStringParametersAsUnicode` is set to false.

The XML configuration file has the following properties, they should be set like this:

```
<connection-property name="sendStringParametersAsUnicode">false</connection-property>
<connection-property name="trustServerCertificate">true</connection-property>
```

Mitigation

Modify the JDBC's XML config file and set the `sendStringParametersAsUnicode` property to `false`.

Public Doc reference

- See article [Data type precedence (Transact-SQL)](#) ⧉ for more information about data type conversions and data type precedence.

- See article [setSendStringParametersAsUnicode Method (SQLServerDataSource)](#) ⧉ for more information about the JDBC property.

Internal reference

Training Materials available:
Implicit conversion is a common root cause for performance slowness. You can learn more about it in the "\dsdb\sqlskills" recording from 2021:
\\dsdb\sqlskills\EE\SQLTraining2021\session7_implicit_convertion_read_ahead_aggregation\

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