Troubleshooting plan forcing errors

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Issue

In some cases you may want to know if and why a plan is not being forced.

This issue can come in a variety of shapes. For example:

- a customer forced a plan and now is the forced plan is not being used
- you forced a plan on QDS but is not working

Investigation/Analysis

When plan forcing fails, the reason for the failure will always be saved on telemetry and on QDS related DMV sp_query_store_force_plan

Using DMV's on customer side might be more quicker to get the reason, since it will contain the error message. On Telemetry we only have the error number.

After obtaining the error number on telemetry, you can either search it on the web or obtain the error message by it's number on any SQL Server (any SQL that you own: SQL Server, MI or Azure SQL).

For example, searching for error 8712:

```
select * from sys.messages
where message_id = 8712
```

This will give:

*Index '%.ls', *specified in the USE PLAN hint, does not exist. Specify an existing index, or create an index with the specified name.*

To get the plan forcing error from telemetry, you can use the query below.

```
MonQueryStoreFailures
| where LogicalServerName == "server_name" and logical_database_name == "database_name"
| where TIMESTAMP > ago(5d)
| where event == "query_store_plan_forcing_failed_core"
| summarize count(), min(TIMESTAMP), max(TIMESTAMP) by query_id, plan_id,  event, error_number
```

It can also be obtained from ASC report on **Performance** -> **Config and Change History** -> **Query Store Failures**

From customer side, using DMV's:

```
SELECT
      p.query_id
       , p.plan_id
       , p.last_force_failure_reason_desc
       , p.force_failure_count
       , p.last_compile_start_time
       , p.last_execution_time
       , q.last_bind_duration
       , q.query_parameterization_type_desc
       , q.context_settings_id
       , c.set_options
       , c.status
    FROM sys.query_store_plan p
    JOIN sys.query_store_query q ON p.query_id = q.query_id
       JOIN sys.query_context_settings c ON c.context_settings_id = q.context_settings_id
       LEFT JOIN sys.query_store_query_text t ON q.query_text_id = t.query_text_id
    WHERE p.is_forced_plan = 1 and p.last_force_failure_reason != 0
and p.query_id = <query_id>; -- change to the desired query_id. Comment this line if you want all failures
```

Note: in some cases plan forcing failure might not result on any error. Check this TSG for more details.

Mitigation

The mitigation is dependent of the error seen. Some common errors and mitigation:

8637: ONLINE_INDEX_BUILD - there is an online index rebuild running. Check of the index rebuild is running an retry. Customer can check for an optimal index rebuild schedule that doesn`t conflict with this queries.

8689: NO_DB - One of the databases target by the execution plan no longer exists. Might have been dropped or renamed. Customer needs to check the query and target objects

8712: NO_INDEX - an index referred on the plan no longer exists. Most likely it was dropped after the plan forcing. Customer needs to recreate the index.

8694: DQ_NO_FORCING_SUPPORTED - the plan cannot be forced because it falls under the QDS limitations

8684: TIME_OUT - update statistics or simplify query by breaking down complexity

Check **Public Doc Reference** and **More Information** sections for further on plan forcing.

More information

Determining What Happens When You Force an Execution Plan via the Query Store

Public Doc Reference

sp_query_store_force_plan

sys.query_store_plan

How good have you found this content?

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