

Forced plan apparently not working. No reason for failed plan forcing

Last updated by | Vitor Tomaz | Feb 24, 2023 at 3:32 AM PST


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Issue

Customer with Query ID X forces Plan ID Y. The plan forcing is apparently not working, since that when querying QDS, Plan ID Z is being used, instead of Plan ID Y.

Investigation/Analysis


Plan forcing can fail due to a variety of reasons. From customer side [sys.query_store_plan](#)  will list the plan forcing failure reason on the **last_force_failure_reason** and **last_force_failure_reason_desc** columns. You can use the query below to check this (change *<query_id>* with the appropriate value).

```
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>;
```

From the telemetry we can also check this (change input parameters as needed):

```
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
```

In some cases we might not see any failure, but still the forced plan is not being used.

This is by design as explained [here](#) 

The resulting execution plan forced by this feature will be the same or similar to the plan being forced. Because the resulting plan may not be identical to the plan specified by sys.sp_query_store_force_plan, the performance of the plans may vary. In rare cases, the performance difference may be significant and negative; in that case, the administrator must remove the forced plan.

This means that during query compilation, the optimizer can change or add operators when sniffing input parameters.

You can find a good reproduction of the behavior [here](#) 

Mitigation

By design. The customer might decide to unforce the plan, allowing the optimizer to decide for an execution plan based on updated statistics.

More information

[What is a "Morally Equivalent Execution Plan," and Why Is It Good?](#) 

Public Doc reference

[sp_query_store_force_plan](#) 

[sys.query_store_plan](#) 

Internal reference

[356878106 - Forced plan does not work](#) 

[351043158 - Force plan id for the query doesn't work, need resolution and RCA](#) 

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