Linked server performance

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Issue

Customer is running a query from SQL Server on prem targeting a Managed instance. The code is also executed on the opposite direction. Both calls are made through a linked server. The query structure basically works on a loop that makes several remote query calls.

Investigation/Analysis

Looking at the query execution plan we can see that the highest wait time is **PREEMPTIVE_OS_CRYPTOS**.

In the OnPrem environment, those are going over DQ that uses DTC if REMOTE_PROC_TRANSACTIONS property is not off (more info here: https://docs.microsoft.com/en-us/sql/t-sql/language-elements/begin-distributed-transaction-transact-sql?view=sql-server-ver15).

In the MI, those are going over DQ as well, but this time it uses Elastic Transactions (ET) if same property is enabled.

For start, DQ part can be a bit slower in MI, if latency/bandwidth between those MI instances is worse then in the OnPrem case. But given that DQ waits are not dominant, it's less likely the root cause.

Now, when it comes to transactions (DTC and ET), in the OnPrem environment, DTC authentication is using Windows auth, and that works quite well.

In MI, DQ transactions are going over ET, that uses UCS protocol for communicating between instances, and that protocol is establishing trust based on the instance certificates. Reading certificates is one of the reasons to have PREEMPTIVE_OS_CRYPTOPS

The password decryption is done repeatedly for each creation of OleDb session for linked server, even if the session is already in cache. This is a local performance issue, it has nothing to do with actual remote connectivity.

Mitigation

Reduce the number of remote calls - for example, fetch all the results to a local table (for example a temp table) and work them locally. This way the number of remote calls is reduced.

Also the customer can try to workaround by setting SET REMOTE_PROC_TRANSACTIONS OFF at session level

Internal Reference

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