Sudden resource consumption drop

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Sudden and unexpected drop in resource consumption

Issue

The customer noticed that the resource consumption for their database suddenly dropped and stays much lower than usual. They want to find why it is lower, as they suspect an unnoticed failure with their applications. Another thought is that consumption was unnecessarily high before and they want to avoid that it goes up again.

Investigation / Analysis

There are several possible causes for this symptom:

- Login errors are preventing the applications from connecting to the database
- The applications have failed and are no longer trying to connect
- All the queries are blocked on a common resource and time out before running their workload
- The most expensive queries used an inefficient execution plan before, which has now changed to a much better plan

You can troubleshoot this the same way as you would a workload increase or a connectivity issue:

1. Check ASC login trend to see if there is a decrease of the client logins
    - Open ASC -> SQL Troubleshooter -> Properties to check "Login Trend" graph.
2. Check query execution count to see if there is a decrease of requests sent to SQL database
    - Open ASC -> SQL Troubleshooter -> Properties -> Performance -> 7 Day Overview tab to check "7 Day Overview of Database Query Execution Count Statistics" graph.
    - Open ASC -> SQL Troubleshooter -> Properties -> Performance -> Overview to check "Query Execution Count Statistics" graph.
3. If the above two show a corresponding decrease, then the resource consumption is caused by workload decrease. Customer should check with their application team what changes the behaviour.
4. If the above two don't show a decrease, then check failed login and SQL attentions to see if there is any issues.

- Open ASC -> SQL Troubleshooter -> Connectivity -> Data Explorer -> Overview tab to check "Logins by error, state and package" graph, if there is an abnormal login failure increase, please troubleshoot for those login errors. This means connections cannot be made to SQL database, so the resource consumption decreases.

- Open ASC -> SQL Troubleshooter -> Connectivity -> Data Explorer -> Disconnects tab to check "Disconnects by KillReason and BatchState" graph, if there is different KillReason rathan than "NormalLogout", this could be a indicater for SQL batch errors. SQL queries may not finish properly before the connection is closed.

5. Check for query timeouts

   - Customer-facing steps are available in Query timeouts.
   - Telemetry-based steps are described in Query Performance and timeouts.

6. Check for blocking

   - See the "Blocking and Deadlocks" tab on the ASC Troubleshooter's performance tab.
   - See Troubleshooting Blocking for more involved steps.

7. Check for query plan changes

   - You might be able so see this on the ASC Troubleshooter's Performance - Query tab.
   - Or you can use the `MonWiQdsExecStats` query from Query Performance and timeouts (step 5) to check for query_hash values that were expensive before and are now lower in resource consumption. Check if they have a different `plan_id` or `query_plan_hash`. Check if the same query now returns significantly fewer rows than before.

Mitigation

- If you see login or query count decreases corresponding to the resource consumption drop timefram, then the root cause is workload decrease. Customer should check with their application team what changes the behaviour.
- If you see abnormal login failure increase or SQL attention/timeout increase, please work on those login failures or SQL errors to get deeper root cause.
- If you see query timeouts, blocking, or any change in execution plans, then proceed with troubleshooting this like a normal performance issue.

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