Discrepancy in CPU metrics between portal metrics and SSMS Performance Dashboard

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Issue

Customer is seeing CPU Usage metrics discrepancy on reports between Azure Portal and SSMS Performance Dashboard.

Investigation/Analysis

Query used to generate CPU usage in performance dashboard report:

```
        declare @ms_now bigint
        select @ms_now = ms_ticks from sys.dm_os_sys_info;
        select top 15 record_id,
        dateadd(ms, -1 * (@ms_now - [timestamp]), GetDate()) as EventTime,
        SQLProcessUtilization,
        SystemIdle,
        100 - SystemIdle - SQLProcessUtilization as OtherProcessUtilization
        from (
        select
        record.value('(./Record/@id)[1]', 'int') as record_id,
        record.value('(./Record/SchedulerMonitorEvent/SystemHealth/SystemIdle)[1]', 'int') as SystemIdle,
        record.value('(./Record/SchedulerMonitorEvent/SystemHealth/ProcessUtilization)[1]', 'int') as SQLPro
        timestamp
        from (
        select timestamp, convert(xml, record) as record
        from sys.dm_os_ring_buffers
        where ring_buffer_type = N'RING_BUFFER_SCHEDULER_MONITOR'
        and record like '%SystemHealth%') as x
  ) as y
order by record_id desc
```

This query is reading from dm_os_ring_buffers, which is relying on performance counters, and is displaying CPU utilization at the **VM level**. This means that performance monitoring dashboard displays CPU utilization of SQL process on the VM level.

For example, if customer provisions 8 vCore business critical managed instance, and that instance lands on the virtual machine with 16 vCores, even when customer uses 100% of provisioned 8 vCores, performance

dashboard will display this as 50% of CPU usage as it is the usage seen from the VM perspective. On the other side, portal is displaying CPU usage in the limits that customer provisioned. So, if customer has provisioned an 8 vCore MI and is using all 8 vCores with full capacity, 100% CPU usage will be displayed in portal.

So, these two reports are displaying completely different information. Customer would benefit with monitoring the performance by the metrics shown in the portal.

Mitigation

There is no mitigation since the Portal CPU usage and SSMS performance dashboard are displaying two different things based on the different sources.

SSMS performance dashboard is displaying CPU usage seen from the VM level. If customer requests X vCore managed instance, it doesn't necessarily mean that it will end up on a virtual machine with X vCores. Y >= X will be used for VM in some cases to avoid noisy neighbor and other effects to ensure that customer instance is running smoothly. So, if for example, customer requests an 8 vCore instance and ends up on 16 vCores VM, CPU usage from performance dashboard will show 50% of CPU usage when SQL is using all provisioned resources. From portal, customer will see 100% usage as SQL is using all **customer provisioned** resources.

This explains the discrepancy between portal metrics and SSMS performance dashboard.

Internal Reference

ICM 336574320

Public Doc Reference

Performance Dashboard built-in

SQL Server Management Studio Performance Dashboard Reports Overview

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