Diagnosing CPU-related Instance Issues

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Module Overview

CPU-related instance-level queries

Interpreting query results

Addressing CPU issues

Processor Description

Identifies exact processor model

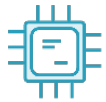
Extremely important for performance and licensing purposes

Works for both physical machines and virtual machines

You can find more detailed information about your CPU online

Processor Description

Extremely important information to understand

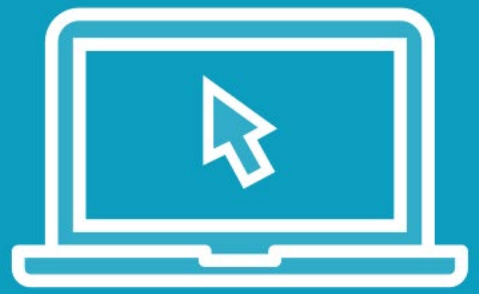


Helps understand age, performance, and scalability of processor

Lets you determine memory capacity of system

Lets you determine generation of PCIe support available

Demo



Processor Description

CPU Utilization History

CPU utilization by SQL Server process

One minute increments for last 256 minutes

Shows total other process CPU utilization

CPU Utilization History

Shows CPU utilization history over last 256 minutes

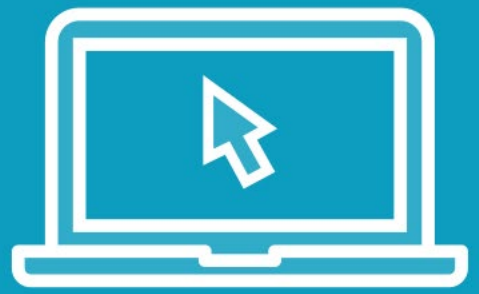
Gives quick impression of normal CPU utilization range

Gives confirmation that other processes are not using too much CPU

Helps understand if you are just seeing a recent spike in CPU activity

Sometimes returns inaccurate results on systems with more than 64 cores

Demo



CPU Utilization History

CPU Utilization by Database

CPU utilization by database

Cumulative average since last SQL Server service start

Shows which database(s) are using most CPU

CPU Utilization by Database

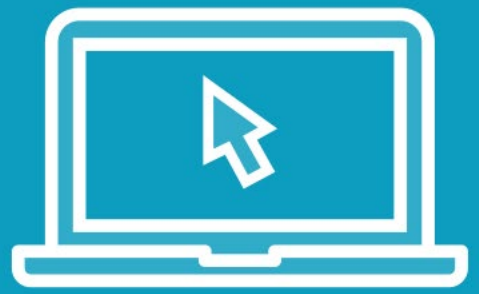
Helps focus your analysis if server is under CPU pressure

Knowing which database is using most CPU is quite useful

More detailed analysis by top CPU queries and stored procedures later

Query and index tuning are often effective for reducing CPU utilization

Demo



CPU Utilization by Database

Top Worker Time Queries

Top worker time queries for all databases on instance

Worker time is tied to CPU utilization

Total worker time numbers usually fall off quickly

Lets you focus tuning efforts on top five results

Top Worker Time Queries

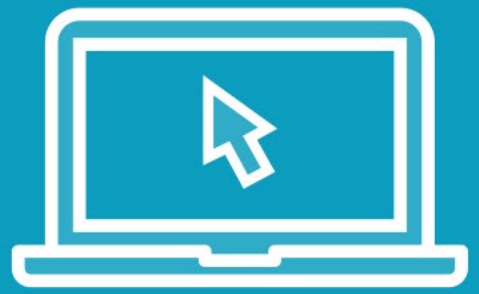
Shows which queries are using most CPU time across entire instance

Look for queries that have a value of 1 for “Has Missing Index” column

More detailed analysis of each query by looking at the query plan

Query and index tuning are often effective for reducing CPU utilization

Demo



Top Worker Time Queries

SP Worker Time

Top stored procedures for current database ordered by worker time

Make sure you are connected to the correct database

Total worker time numbers usually fall off very quickly

Average elapsed times are in microseconds

SP Worker Time

Shows which SPs are using the most CPU time for the current database

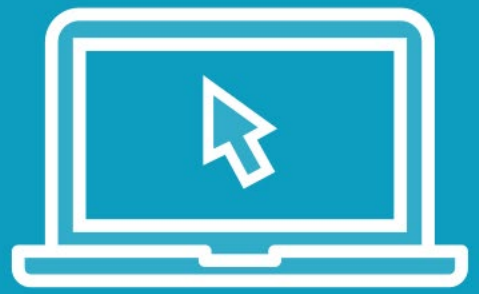
Look for queries that have a value of 1 for “Has Missing Index” column

Also look at “AvgWorkerTime” to identify easy tuning opportunities

More detailed analysis of each SP by looking at the query plan

Query and index tuning often effective for reducing CPU utilization

Demo



SP Worker Time

High Aggregate CPU Queries

Query Store must be enabled for this query to return results

This query is database-specific

Make sure that Query Store is not in a read-only status

Highest aggregate CPU queries over the past hour

High Aggregate CPU Queries

Shows queries that have most total CPU activity over past hour

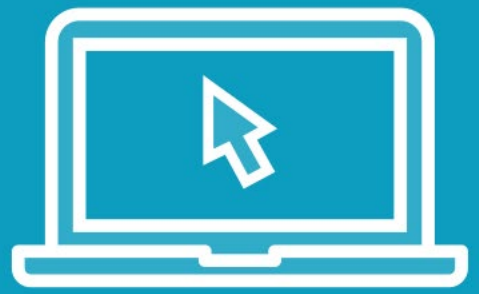
Returns query text so you can spot common query issues

Returns query plan XML so you can view graphical execution plan

Shows plan count for each plan which helps identify plan stability issues

Identifies which stored procedures have forced plans

Demo



High Aggregate CPU Queries

What We Covered

CPU-related instance-level queries

Interpreting query results

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