#AzureSQLDB

Achieve great performance with Azure SQL Database using built-in Artificial Intelligence

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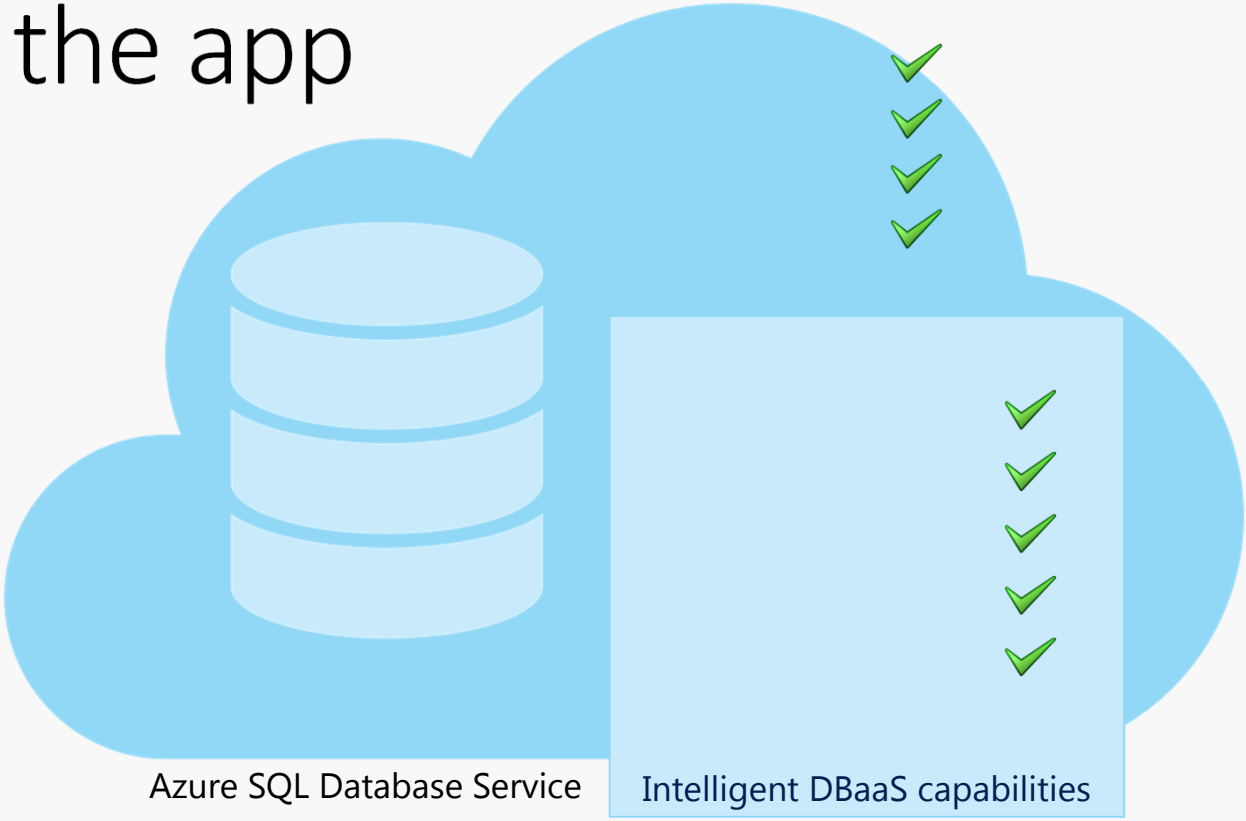
11-time Microsoft MVP Data Platform

Microsoft

DBaaS Evolution

User can focus on the app



DBaaS v2.0 - Intelligent Database Service

- Platform manages all aspects of running and tuning the DB

Azure SQL Database performance powered by built-in intelligence

Insights into DB Performance

- Query Store for tracking query perf
- Query Insights for monitoring & tuning

Tailored Tuning Recommendations

- Adjusted as your app evolves over time
- Easy to implement and validate

Automatic Tuning

- No human intervention needed
- Easily scales to 1000s of DBs

Microsoft

Automatic Tuning

Add indexes, drop indexes , automatic plan correction

Automatic Tuning - Indexes

- Automatic index management is **only** available in Azure SQL Database since 2016 Q4.
- It can create indexes that are missing, and it can remove indexes that are not used, and those that are duplicates.
- It uses data from Query Store and management views, and combines that data with an internal model to determine the benefit of the index.

Automatic Tuning - Indexes

- For index creation there is, presently, a rolling window of seven (7) days across which the data is tracked, and at a minimum the model needs nine (9) hours of data to recommend an index, along with 12 hours of data in Query Store that will be used as a baseline. If it's determined that an index will provide significant benefit, then SQL Server will create the index.
- In case of query regression, drop the index.

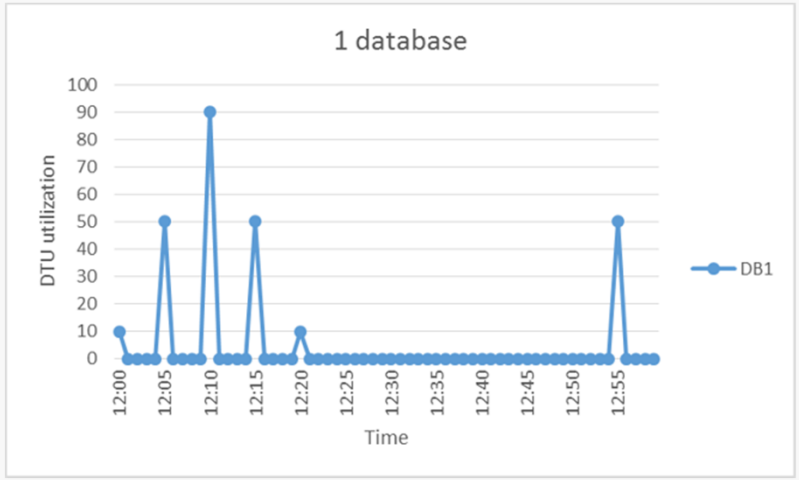
Automatic Tuning - Indexes

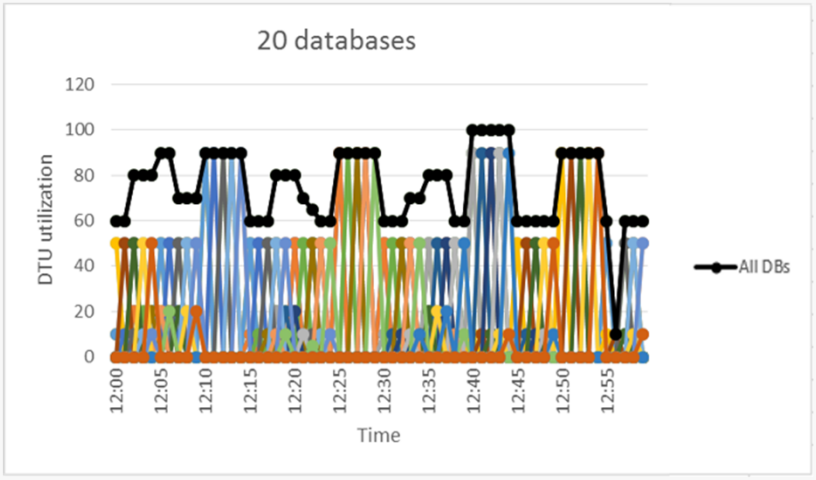
- With regard to dropping indexes, if an index has no seeks or scans for 90 days, but does have a maintenance cost (meaning there are inserts, updates, or deletes) then it will be dropped.
- Duplicate indexes will be dropped
- On Azure for every 2 indexes dropped 1 index is created.
- 2 millions of databases participated on the creation of automatic index management.

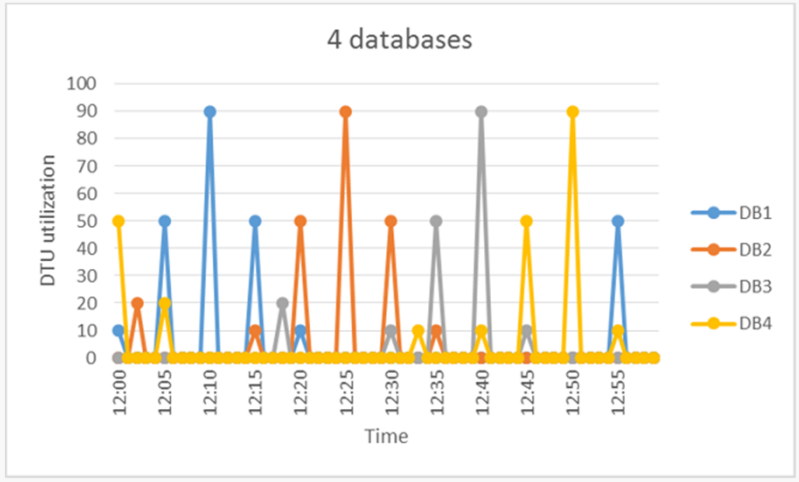
Automatic Tuning – Automatic Plan Regression

- With Automatic Plan Correction, if SQL Server finds that a query has regressed significantly, it will force the last-known good plan for the query to stabilize performance.
- It uses Query Store also (is a as flight-recorder for your database that tracks query text, plans, runtime statistics and wait statistics, it also allows you to force a plan for a query to allow for consistent performance.

Why do recommendations matter?







Databases in the pool share resources

How do you know which databases would not be active at the same time?

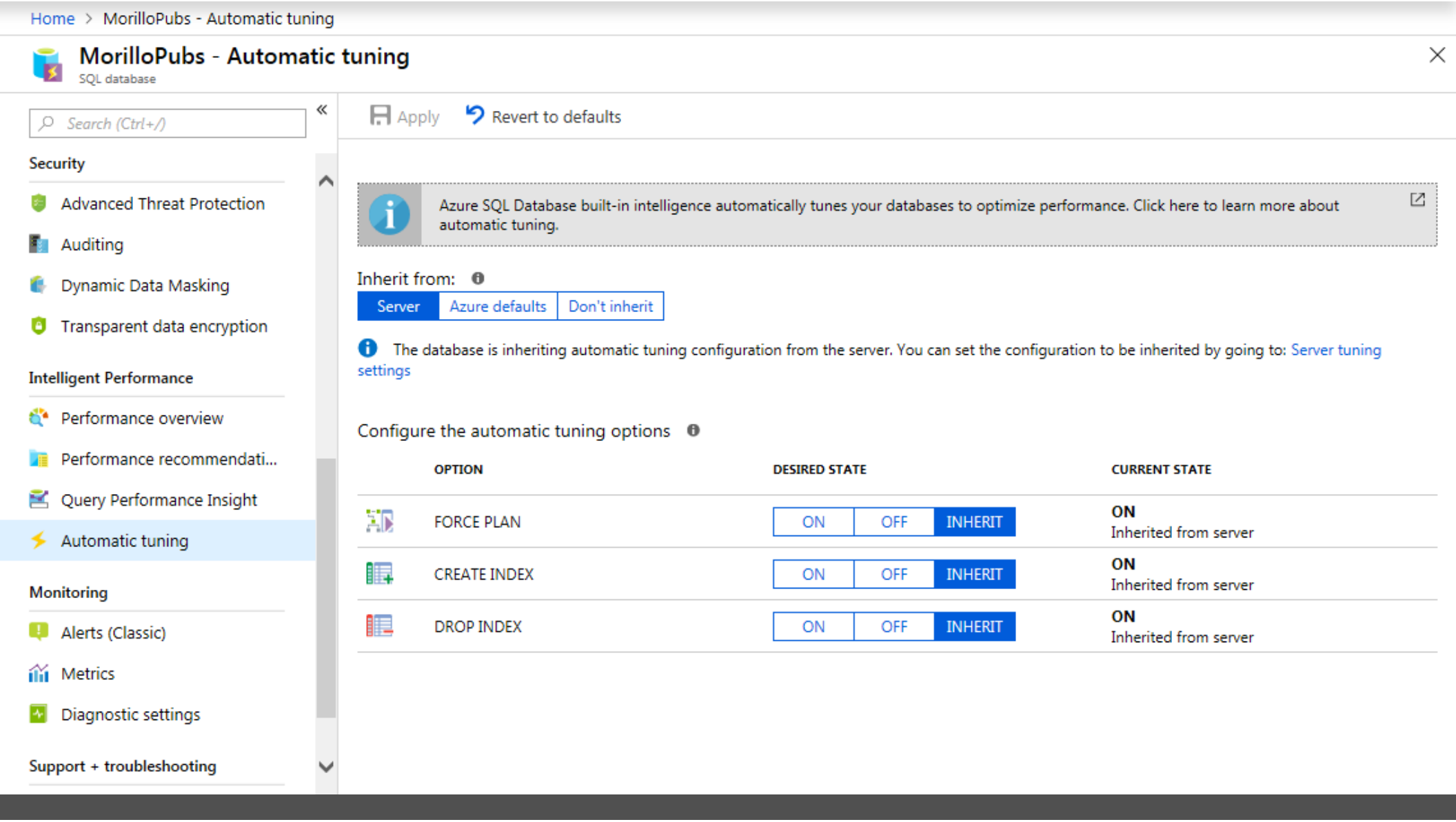
How large pool is enough?

What parameters of the pool are optimal?

Demo

Setting up automated tuning.

Synthetic workload


Home > MorilloPubs - Automatic tuning
MorilloPubs - Automatic tuning
SQL database
Search (Ctrl+/)
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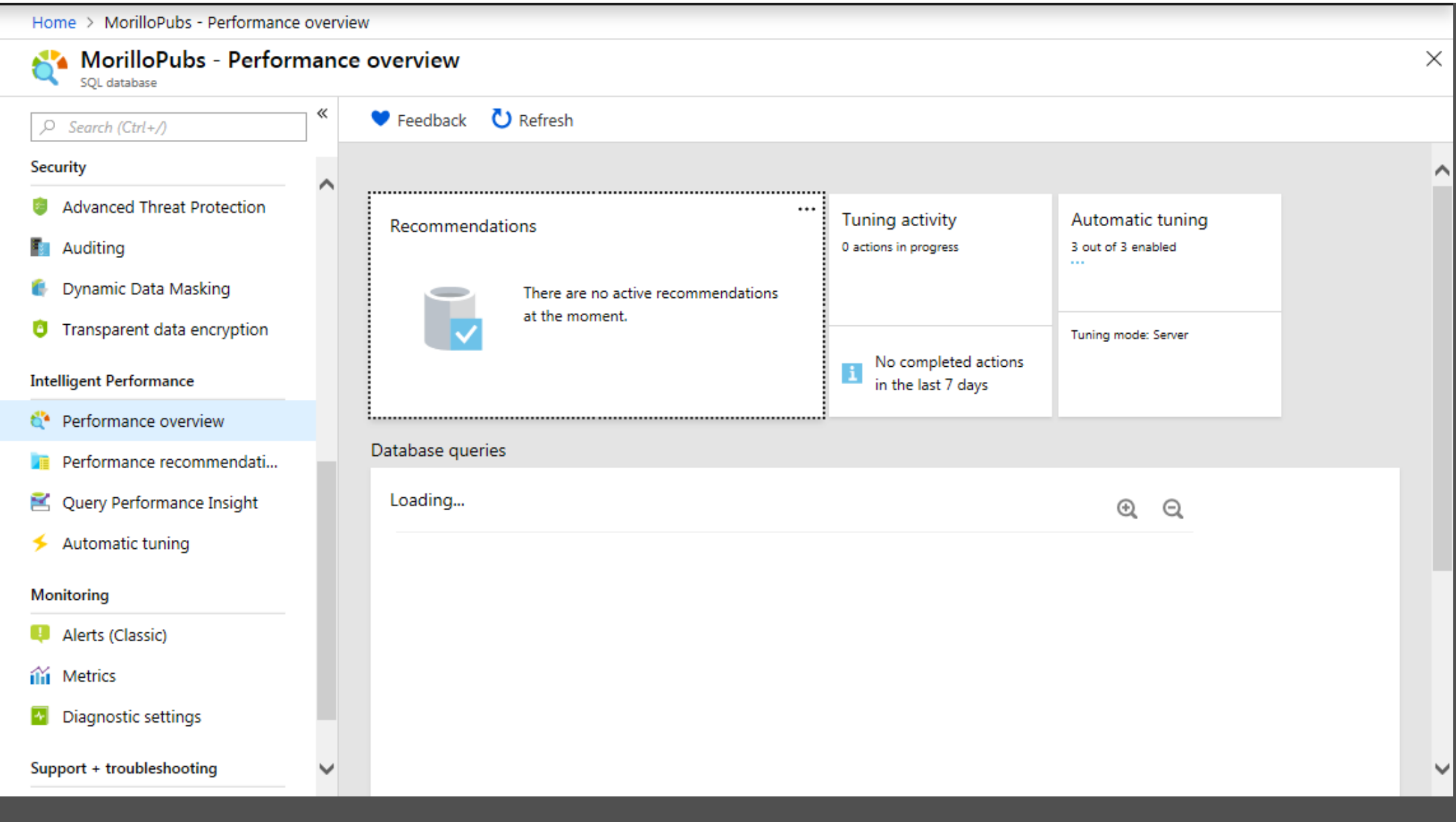
Auditing
Dynamic Data Masking
Transparent data encryption
Intelligent Performance
Performance overview
Performance recommendati...
Query Performance Insight
Automatic tuning
Monitoring
Alerts (Classic)
Metrics
Diagnostic settings
Support + troubleshooting
Apply
Revert to defaults
Azure SQL Database built-in intelligence automatically tunes your databases to optimize performance. Click here to learn more about automatic tuning.
Inherit from:
Server
Azure defaults
Don't inherit
The database is inheriting automatic tuning configuration from the server. You can set the configuration to be inherited by going to: Server tuning settings
Configure the automatic tuning options
OPTION
DESIRED STATE
CURRENT STATE
FORCE PLAN
ON
OFF
INHERIT
ON
Inherited from server
CREATE INDEX
ON
OFF
INHERIT
ON
Inherited from server
DROP INDEX
ON
OFF
INHERIT
ON
Inherited from server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Intelligent Performance
Performance overview
Performance recommendati...
Query Performance Insight
Automatic tuning
Monitoring
Alerts (Classic)
Metrics
Diagnostic settings
Support + troubleshooting
Feedback
Refresh
Recommendations
There are no active recommendations at the moment.
Tuning activity
0 actions in progress
No completed actions in the last 7 days
Automatic tuning
3 out of 3 enabled
Tuning mode: Server
Database queries
Loading...

Insights into DB Performance

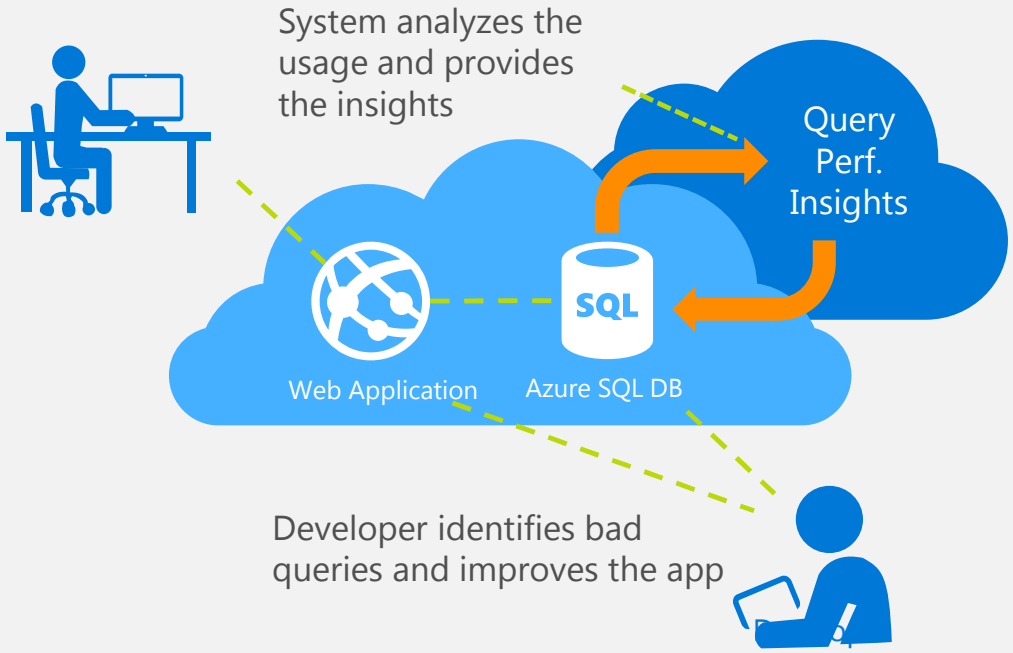
Intelligent Insights

Intelligent Insights

- Uses built-in intelligence to continuously monitor database usage through AI and detect disruptive events that cause poor performance.
- Once detected, a detailed analysis is performed that generates a diagnostics log with an intelligent assessment of the issue. This assessment consists of a root cause analysis of the database performance issue and, where possible, recommendations for performance improvements.

Optimizing query performance and costs

Query Performance Insights



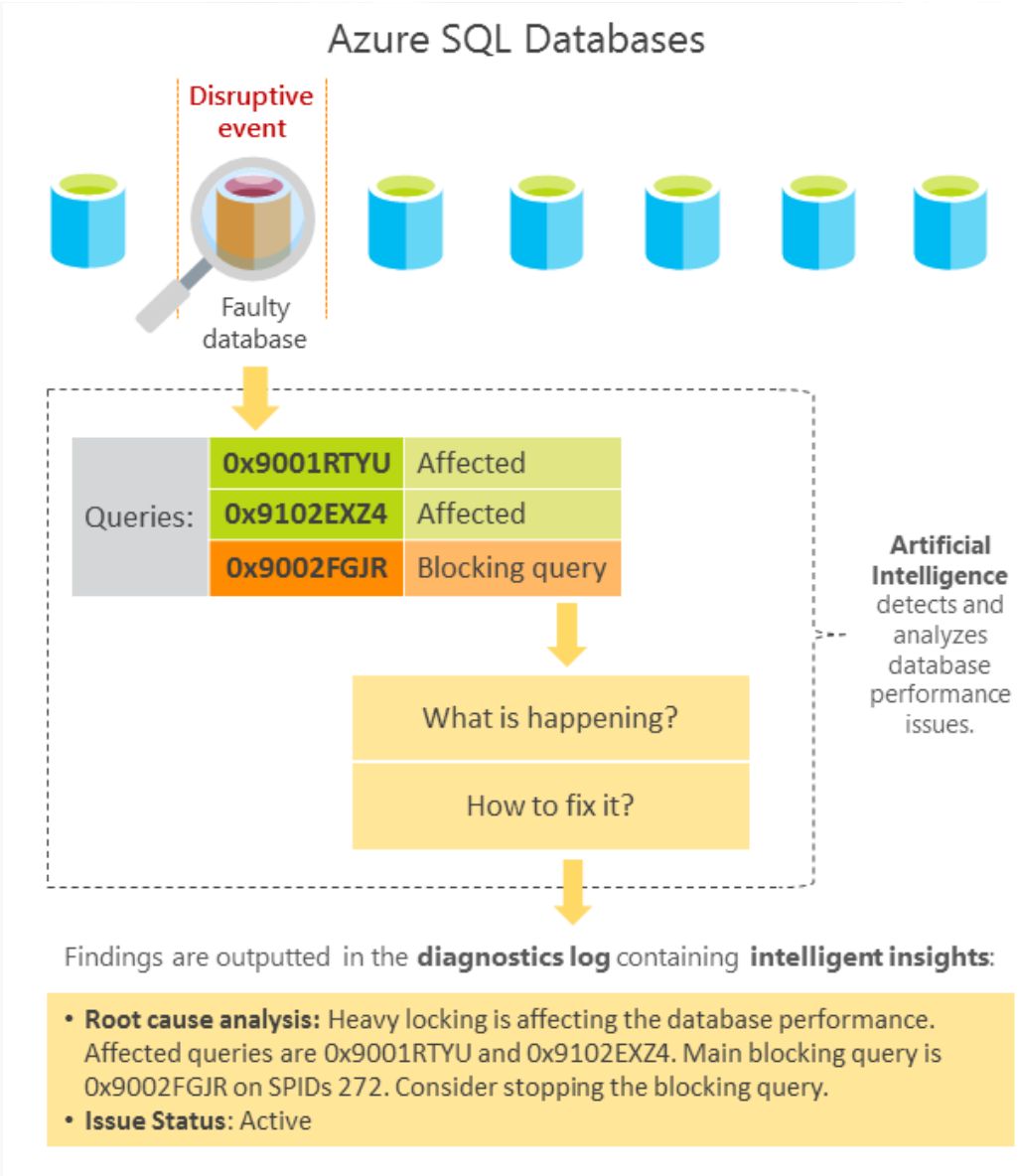
Works on top of Query Store

Easy to use UX in Azure portal

Top insights into your workload

- Database Transaction Units (DTUs),
- Resource breakdown (CPU, I/O,…),
- Query duration and execution counts

- Proactive monitoring
- Tailored performance insights
- Early detection of database performance degradation
- Root cause analysis of issues detected
- Performance improvement recommendations
- Scale out capability on hundreds of thousands of databases
- Positive impact to DevOps resources and the total cost of ownership



Demo - Insights into DB Performance

Query Performance Insights configuration.

Diagnostics log streamed to Azure SQL Analytics

Home > Marketplace > Everything > Azure SQL Analytics (Preview)

PUBLISHER	CATEGORY
Microsoft	Management Tools

Azure SQL Analytics (Preview)

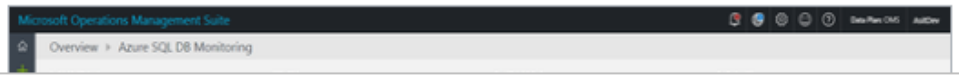
Microsoft

Operations Management Suite (OMS) is a management offering which provides monitoring for Azure Resources through the Log Analytics service. Log Analytics enables users to collect, correlate and visualize structured and unstructured data. Through the out of the box solutions available in OMS Log Analytics, users can easily monitor and receive notifications on the health of their Azure Resources such as SQL Azure.

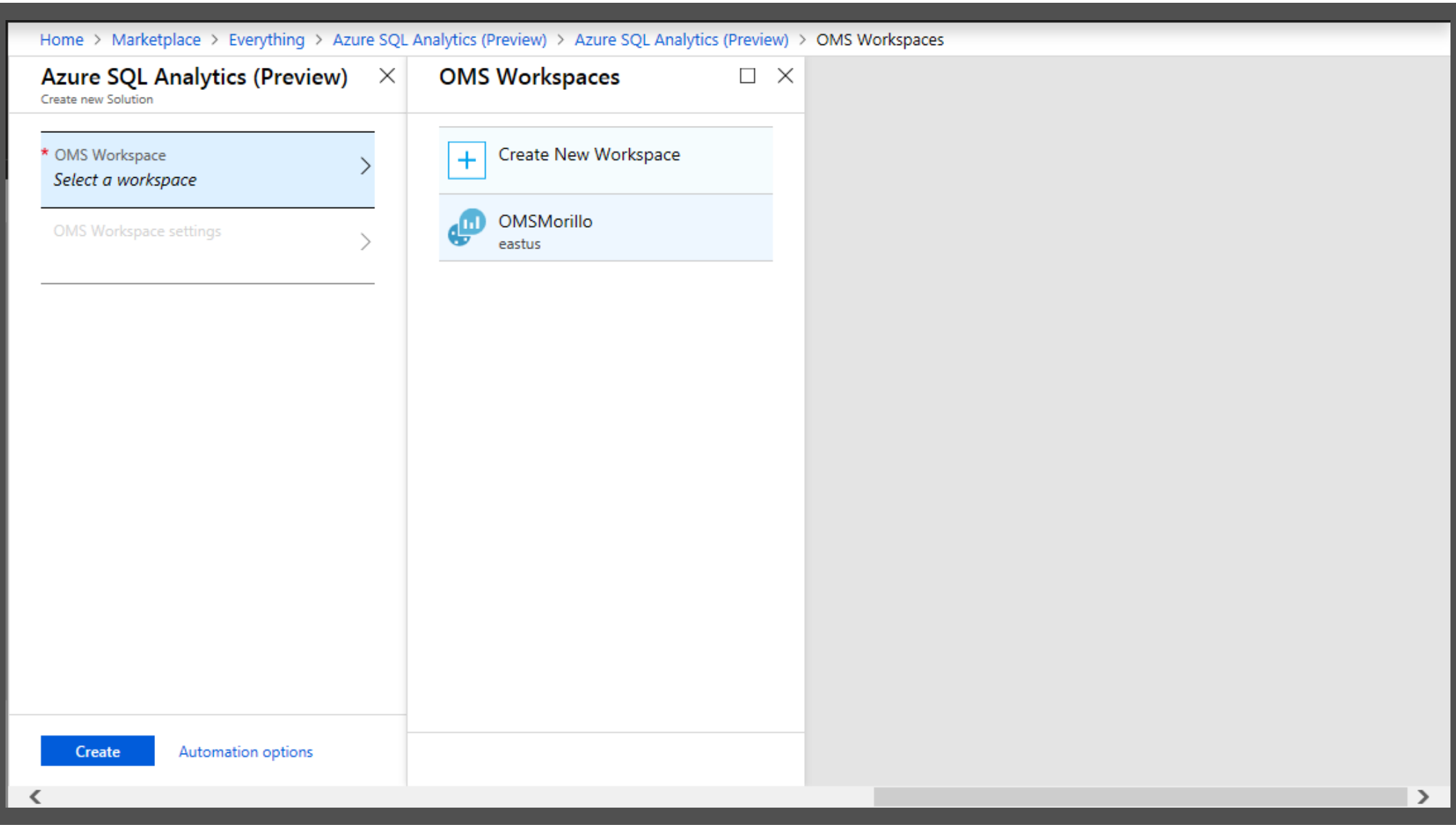
Microsoft Azure SQL Database, also known as Azure SQL, is a scalable relational database service that provides familiar SQL-Server-like capabilities to applications running in Azure cloud. OMS Log Analytics collects and visualizes the important SQL Azure performance metrics and enables users to easily create custom monitoring rules in addition to those provided with the solution. OMS Log Analytics enables you to monitor across multiple Azure subscriptions, resources and elastic pools and more importantly lets you identify issues at each layer of your application stack. This preview solution supports up to 150,000 Azure SQL Databases and 5,000 SQL Elastic Pools.

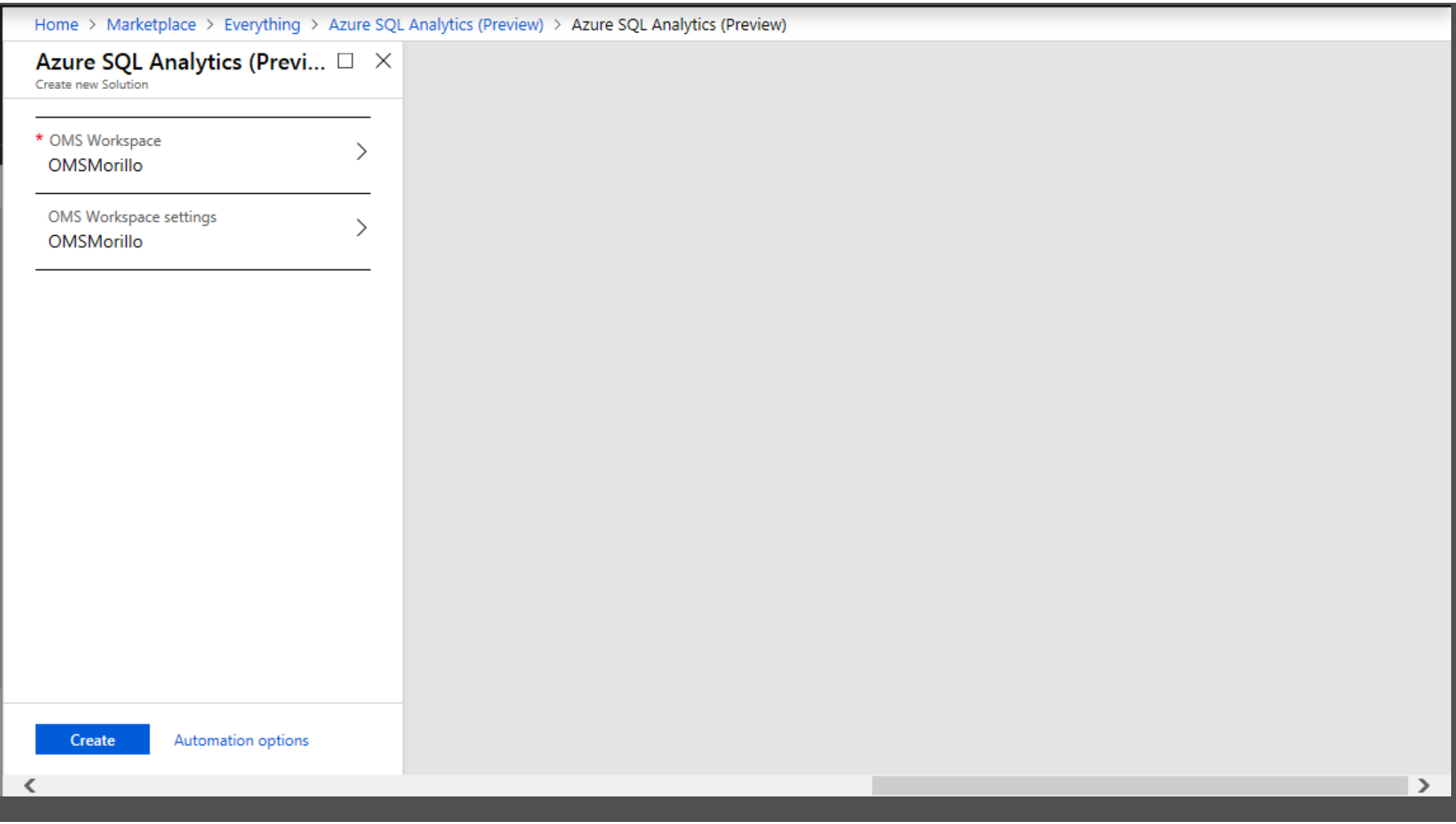
If you use this solution, you will need to enable Azure SQL Metric logging by following the instruction found here: https://aka.ms/sqlazureonboarding

Save for later



Create


Home > Marketplace > Everything > Azure SQL Analytics (Preview) > Azure SQL Analytics (Preview) > OMS Workspaces
Azure SQL Analytics (Preview)
Create new Solution
* OMS Workspace
Select a workspace
OMS Workspace settings
Create
Automation options
OMS Workspaces
Create New Workspace
OMSMorillo
eastus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Azure SQL Analytics (Previ...
Create new Solution
* OMS Workspace
OMSMorillo
OMS Workspace settings
OMSMorillo
Create
Automation options

Query

OMSMorillo

Refresh Analytics

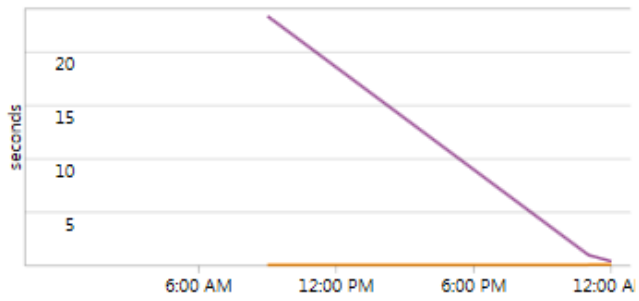
Last 24 hours

QUERY TEXT

Query hash: 0xFD27317BA7C1FCB3

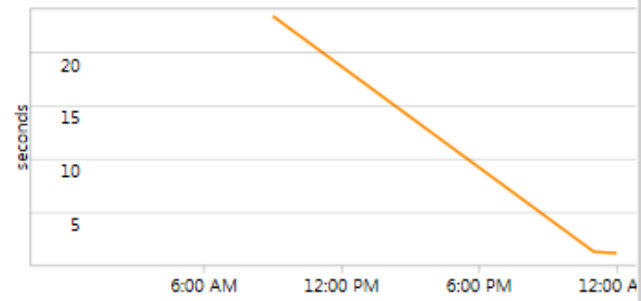
```
1  SELECT * FROM dbo.bigProduct
2  WHERE ListPrice between 1 and 200001
3  ORDER by [Name] DESC
```

DURATION



DATABASE	MAX (S)	AVG (S)	CPU (S)	EXECS
morillo.morillopubs	23.3	6.28	0.079	4

WAITS DURATION



DATABASE	WAIT CATEGORY	AVG (S
morillo.morillopubs	NETWORKIO	11.8
morillo.morillopubs	CPU	0.302
morillo.morillopubs	UNKNOWN	0.272

Home > AzureSQLAnalytics(OMSMorillo) > Azure SQL Analytics (Preview) > Database > Query

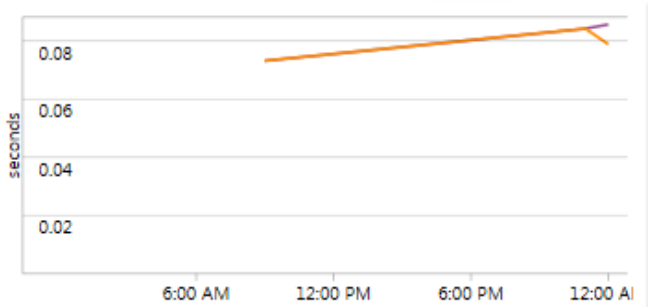
Query

OMSMorillo

Refresh Analytics

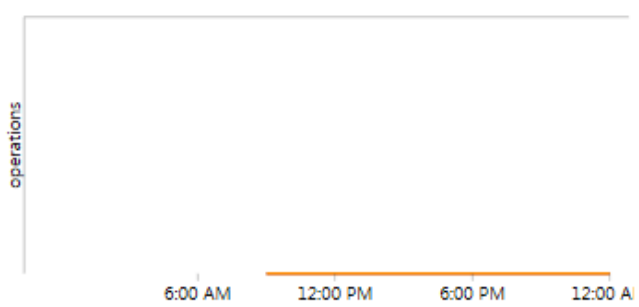
Last 24 hours

CPU



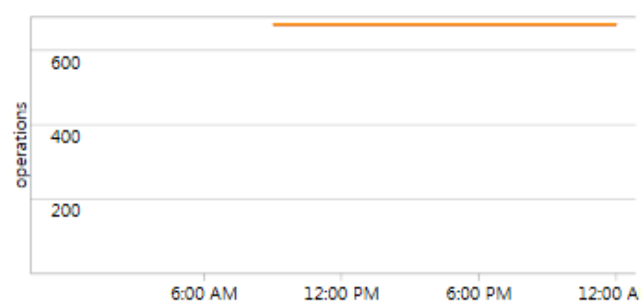
DATABASE	MAX (S)	AVG (S)	CPU (S)	EXECS
morillo.morillopubs	0.086	0.079	4	-

DATA IO



DATABASE	MAX	AVG	EXECS
morillo.morillopubs	0	0	4

LOG IO



DATABASE	MAX	AVG	EXECS
morillo.morillopubs	669	669	4