PERFORMANCE OPTIMIZATION

Taiob Ali

Everything Is Slow!

Any
Code Change or
New
Deployment?

https://www.business2community.com/strategy/means-business-0722156

Everything Is Slow!

Is Your Cloud Storage Slow?

https://www.business2community.com/strategy/means-business-0722156

Everything Is Slow!

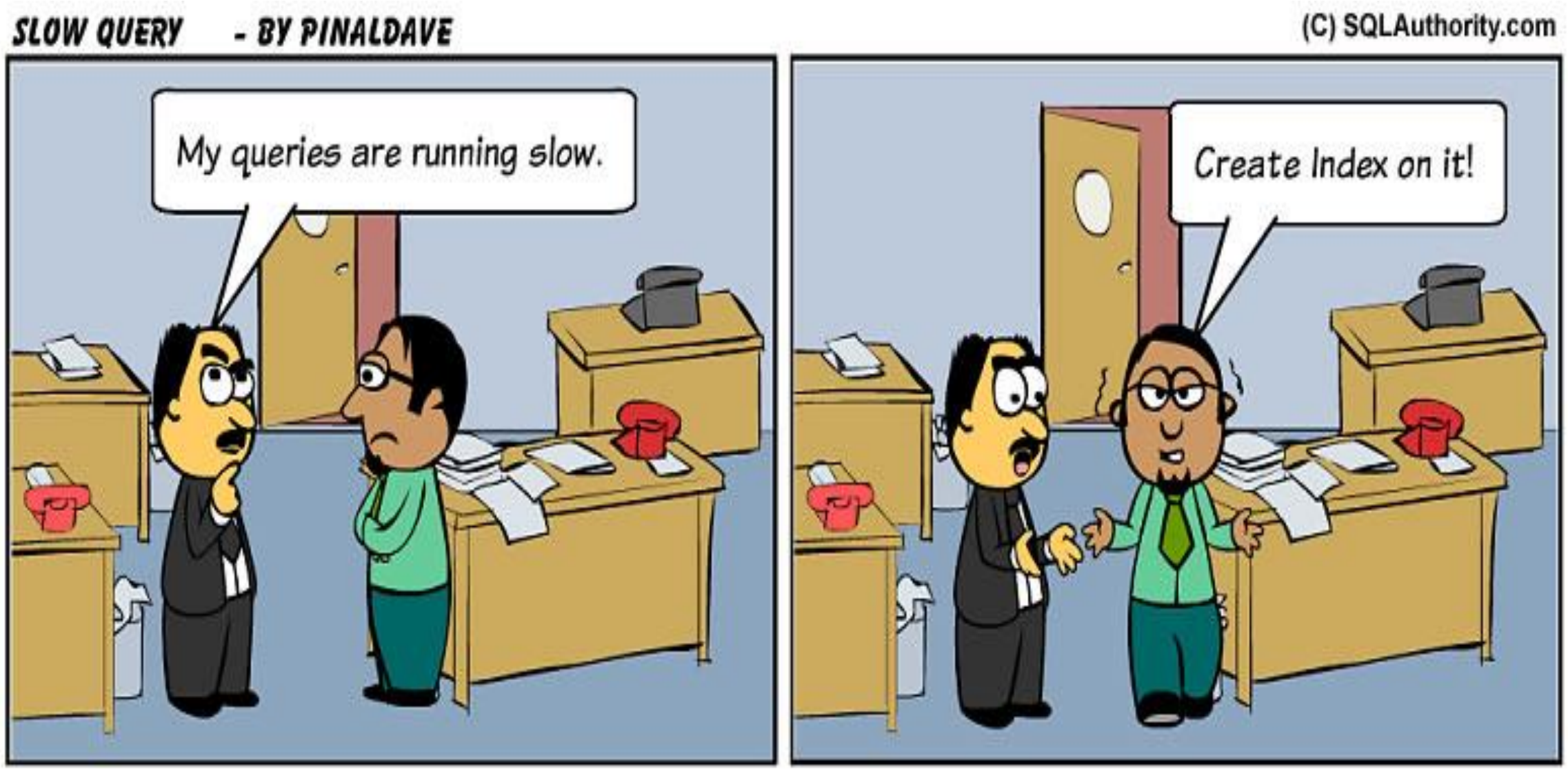
How about Network?

https://www.business2community.com/strategy/means-business-0722156

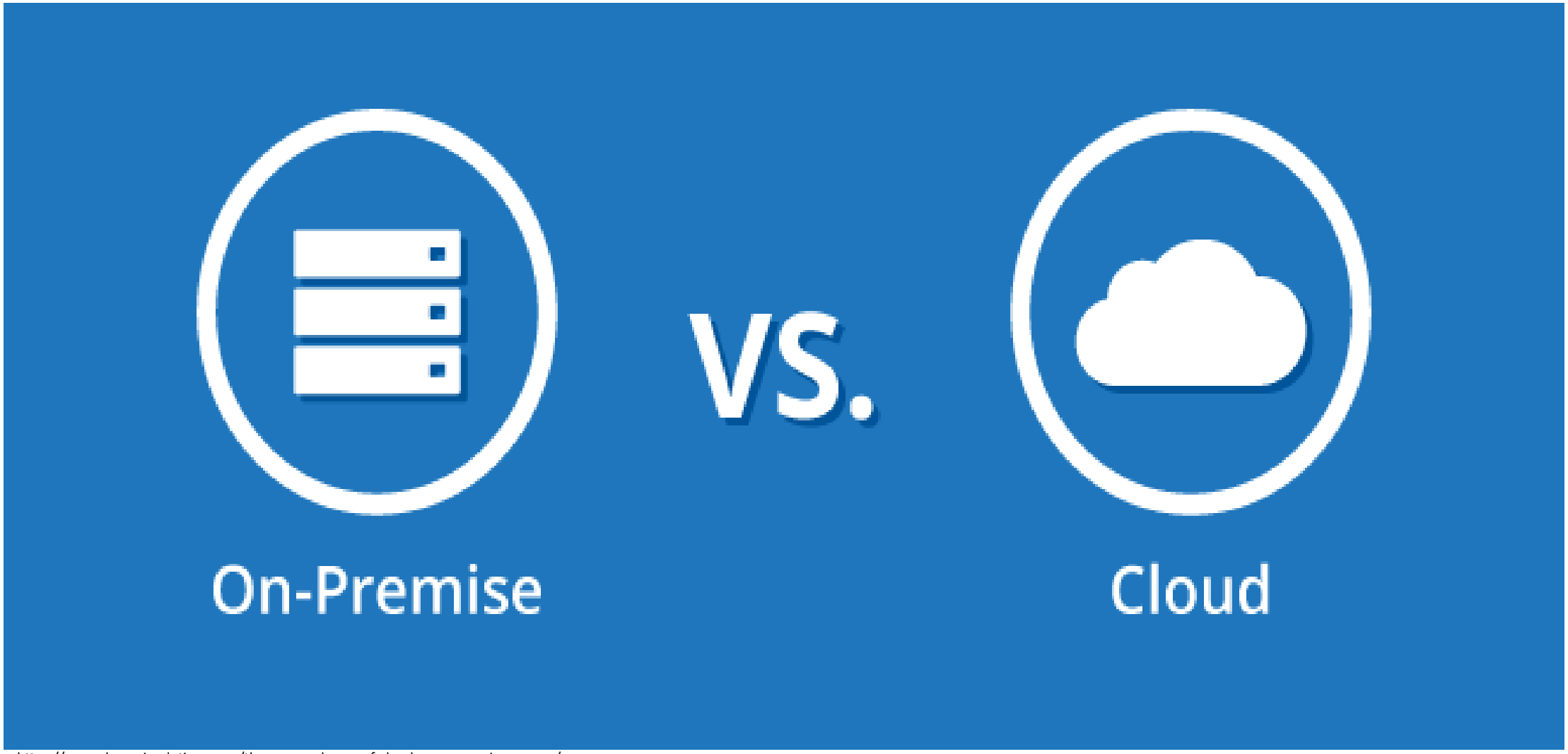
Everything Is Slow!

It must be database!

http://horizonmindcare.com/Facilities/Academic
https://pngtree.com/freepng/green-yes-tag-vector-material_2870721.html


SLOW QUERY - BY PINALDAVE
(C) SQLAuthority.com
My queries are running slow.
Create Index on it!

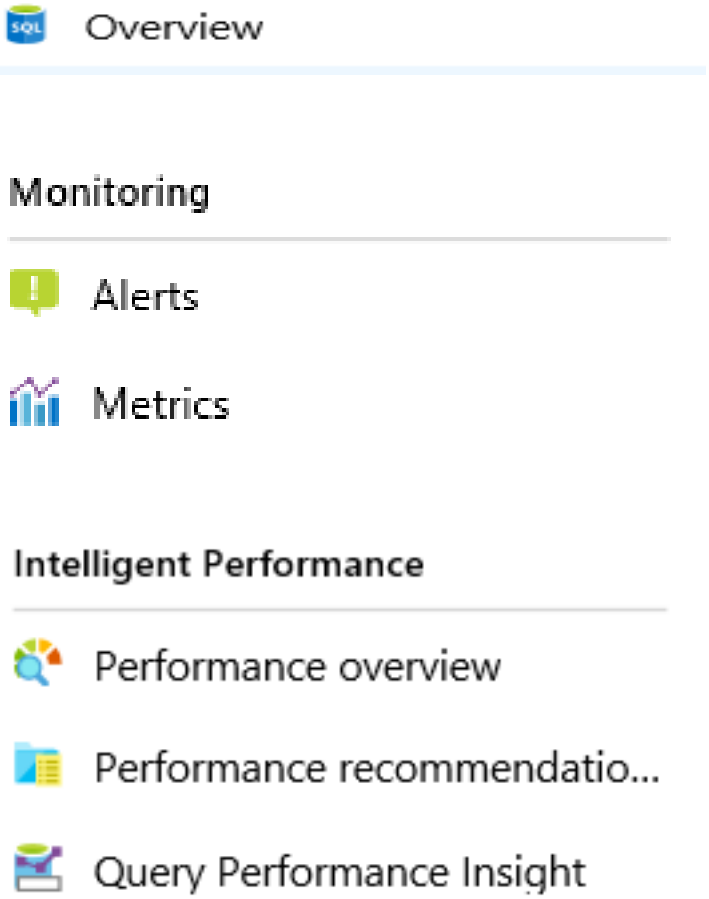
Tools



https://www.dynamixsolutions.com/the-pros-and-cons-of-cloud-vs-on-premise-servers/

Tuning Option

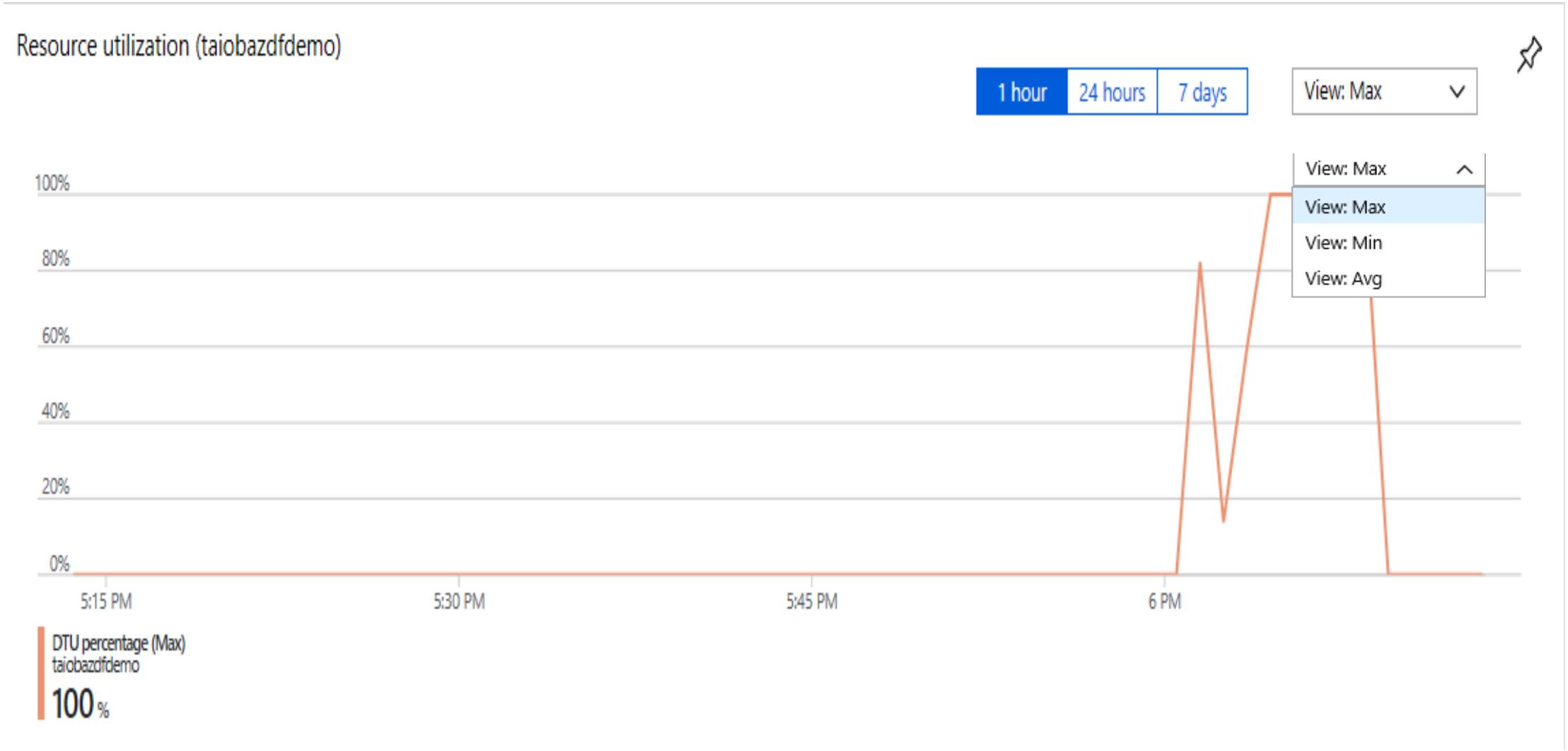
Traditional	Azure Basic	Azure Advanced
• DMV • Extended Events • Query Store	• Overview • Performance Insight • Performance Recommendation	• Automatic Tuning • Intelligent Insights-Azure SQL Analytics



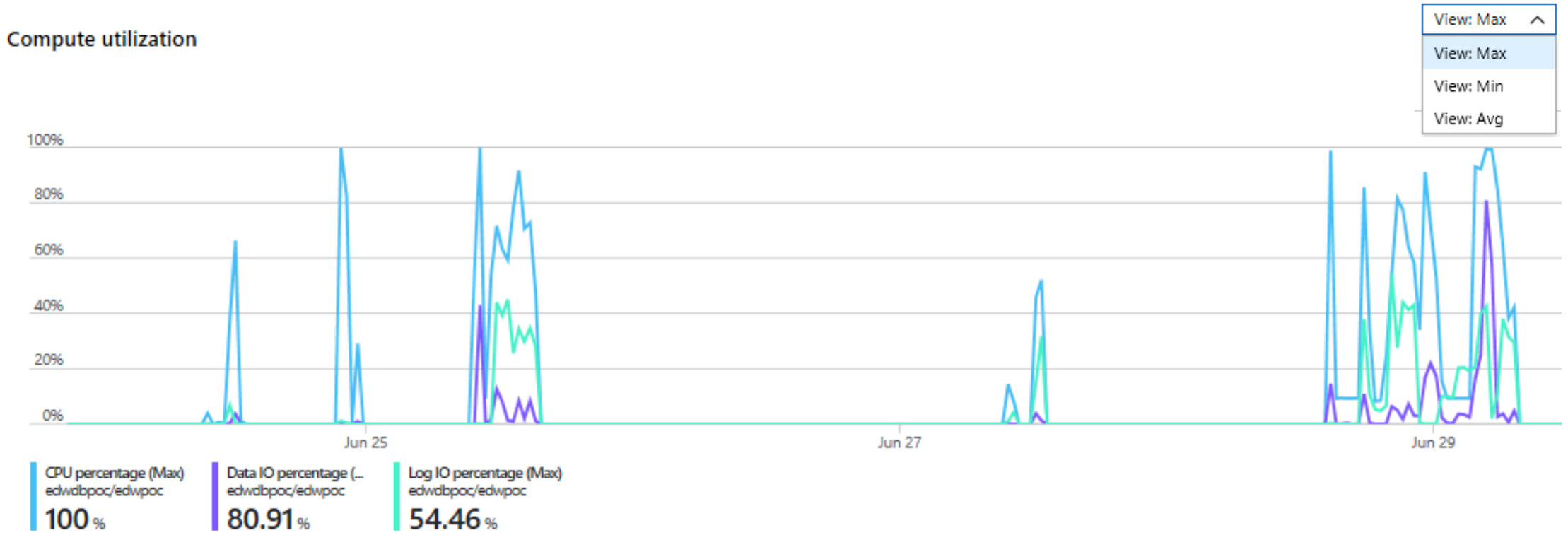
Automatic Tuning

Azure SQL Analytics

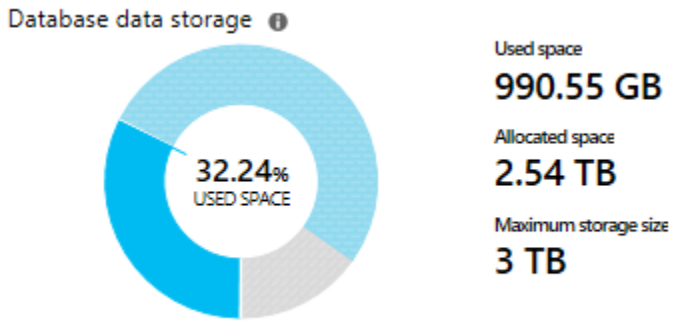
Overview


Resource utilization (taiobazdfdemo)
1 hour
24 hours
7 days
View: Max
View: Max
View: Max
View: Min
View: Avg
100%
80%
60%
40%
20%
0%
5:15 PM
5:30 PM
5:45 PM
6 PM
DTU percentage (Max)
taiobazdfdemo
100 %

Overview


Compute utilization
View: Max
View: Max
View: Min
View: Avg
100%
80%
60%
40%
20%
0%
Jun 25
Jun 27
Jun 29
CPU percentage (Max)
edwdbpoc/edwpoc
100 %
Data IO percentage (...
edwdbpoc/edwpoc
80.91 %
Log IO percentage (Max)
edwdbpoc/edwpoc
54.46 %

Overview



Notifications (0) | Database features (7)

All | Security (4) | Performance (1) | Recovery (2)

Transparent data encryption

Encryption at rest for your databases, backups, and logs.

CONFIGURED

Advanced Data Security

Data Discovery & Classification, Vulnerability Assessment and Advanced Threat Protection.

NOT CONFIGURED

Automatic tuning

Monitors and tunes your database automatically to optimize performance.

NOT CONFIGURED

Auditing

Track database events and writes them to an audit log in Azure storage.

NOT CONFIGURED

Geo-Replication

Protect your data from disaster by creating secondaries in other regions.

NOT CONFIGURED

Dynamic Data Masking

Limit sensitive data exposure by masking it to non-privileged users.

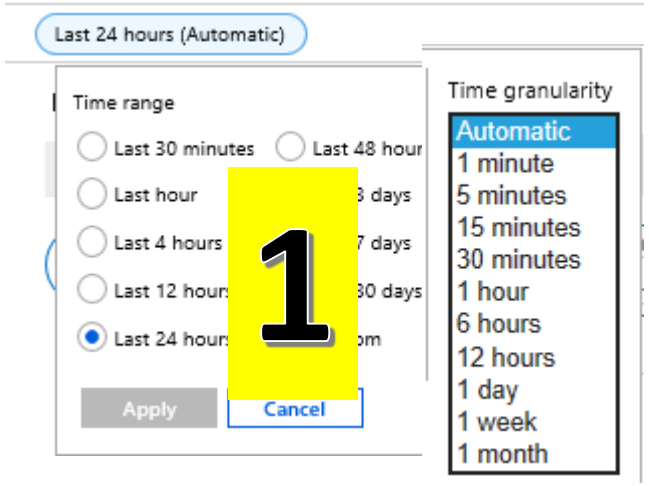
CONFIGURED

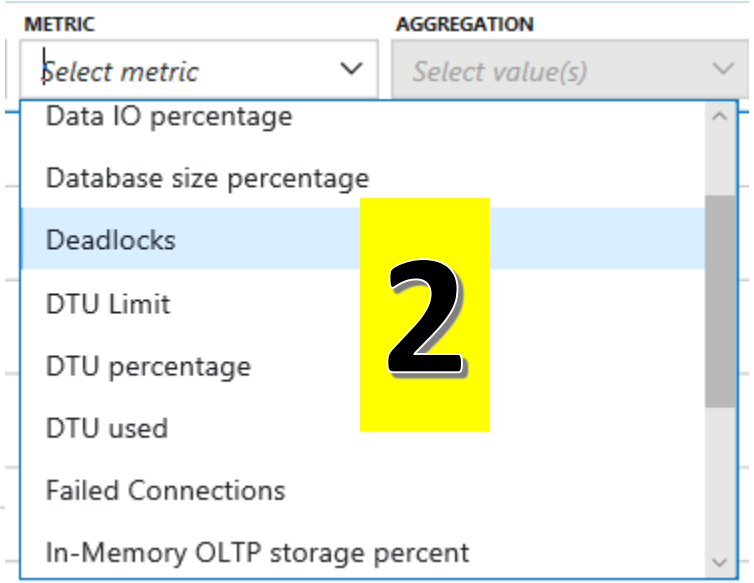
Zone Redundant

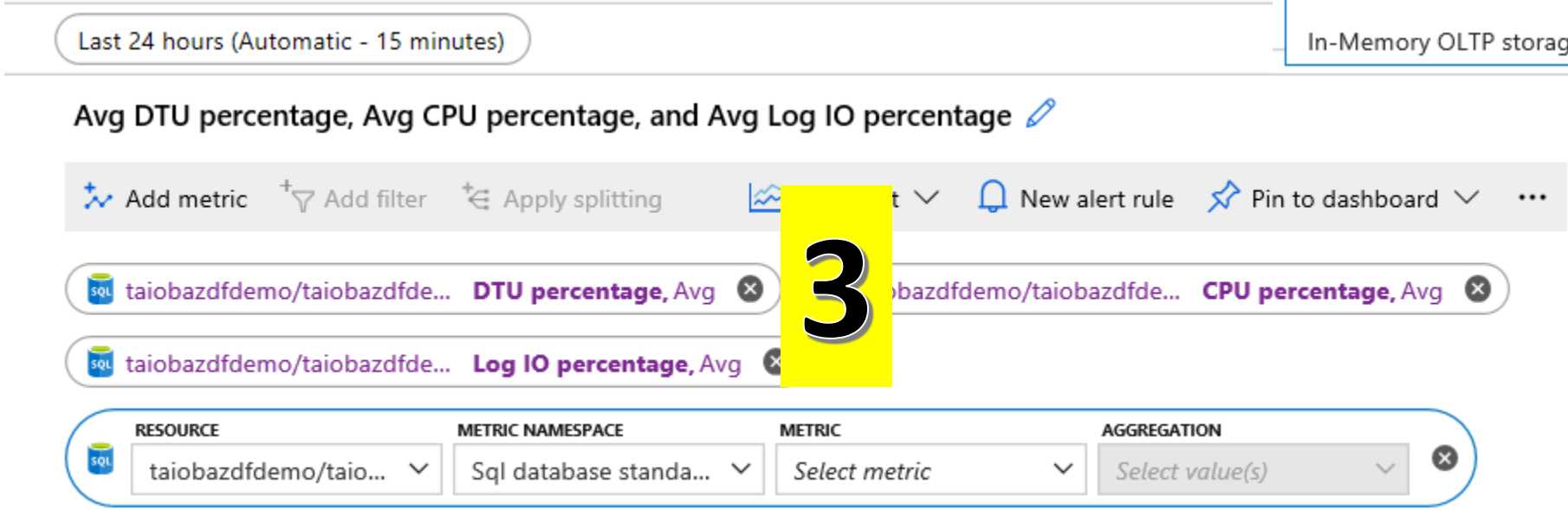
Provides enhanced region availability by spreading replicas across availability zones.

DISABLED

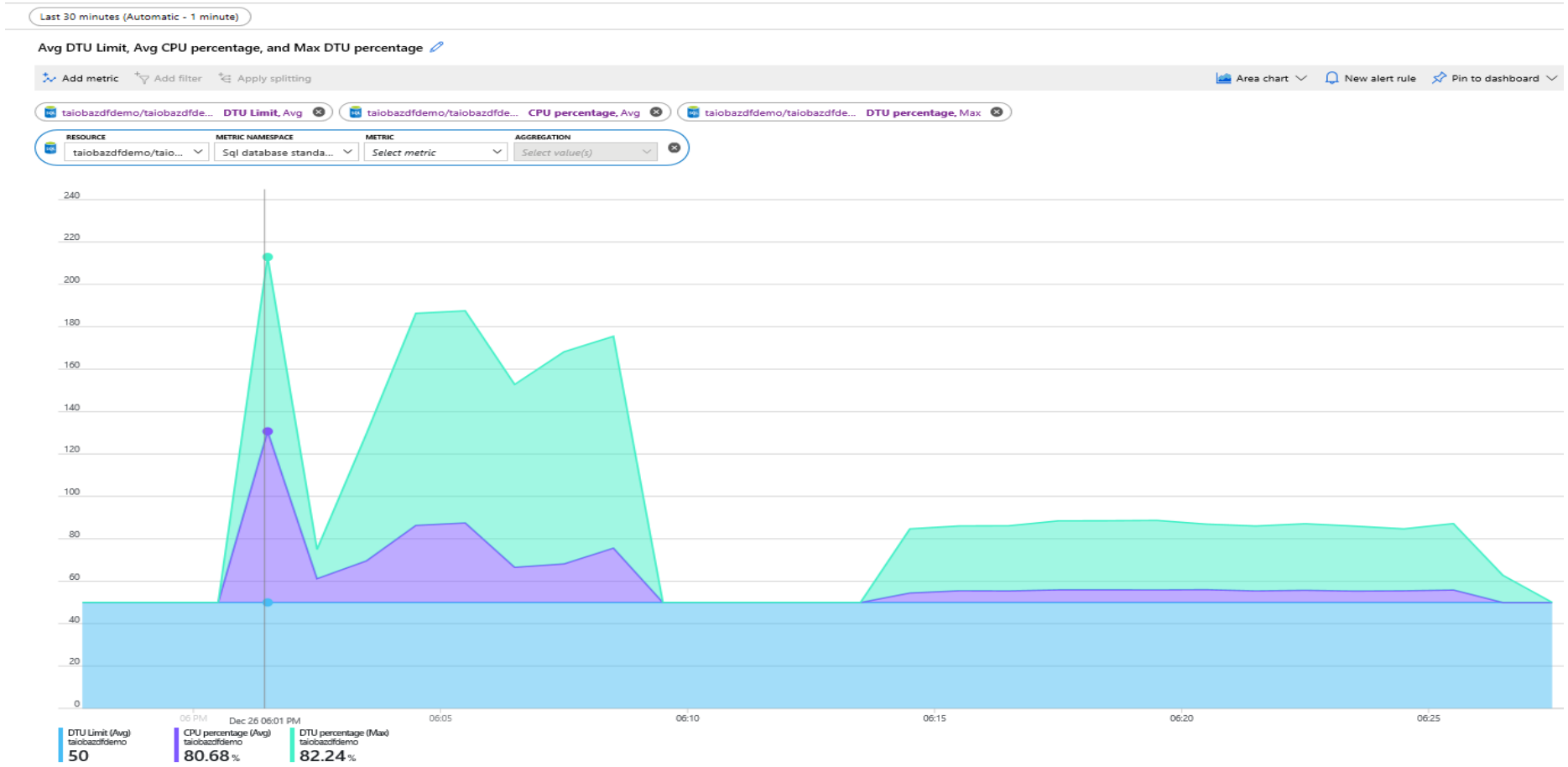
Metrics


Last 24 hours (Automatic)
Time range
Last 30 minutes
Last 48 hour
Last hour
Last 4 hours
Last 12 hours
Last 24 hours
Apply
Cancel
Time granularity
Automatic
1 minute
5 minutes
15 minutes
30 minutes
1 hour
6 hours
12 hours
1 day
1 week
1 month
1

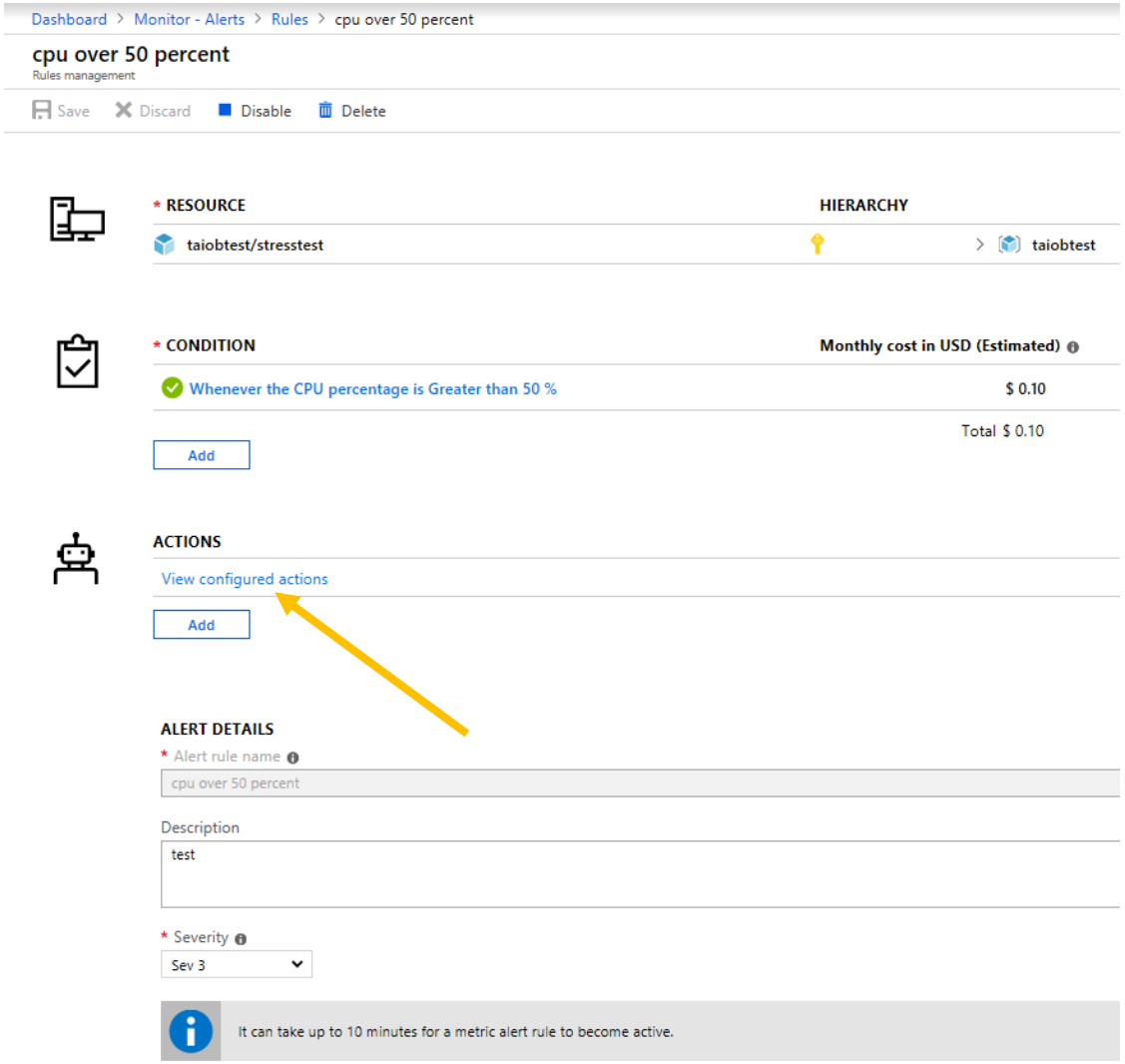

METRIC
AGGREGATION
Select metric
Select value(s)
Data IO percentage
Database size percentage
Deadlocks
DTU Limit
DTU percentage
DTU used
Failed Connections
In-Memory OLTP storage percent
2

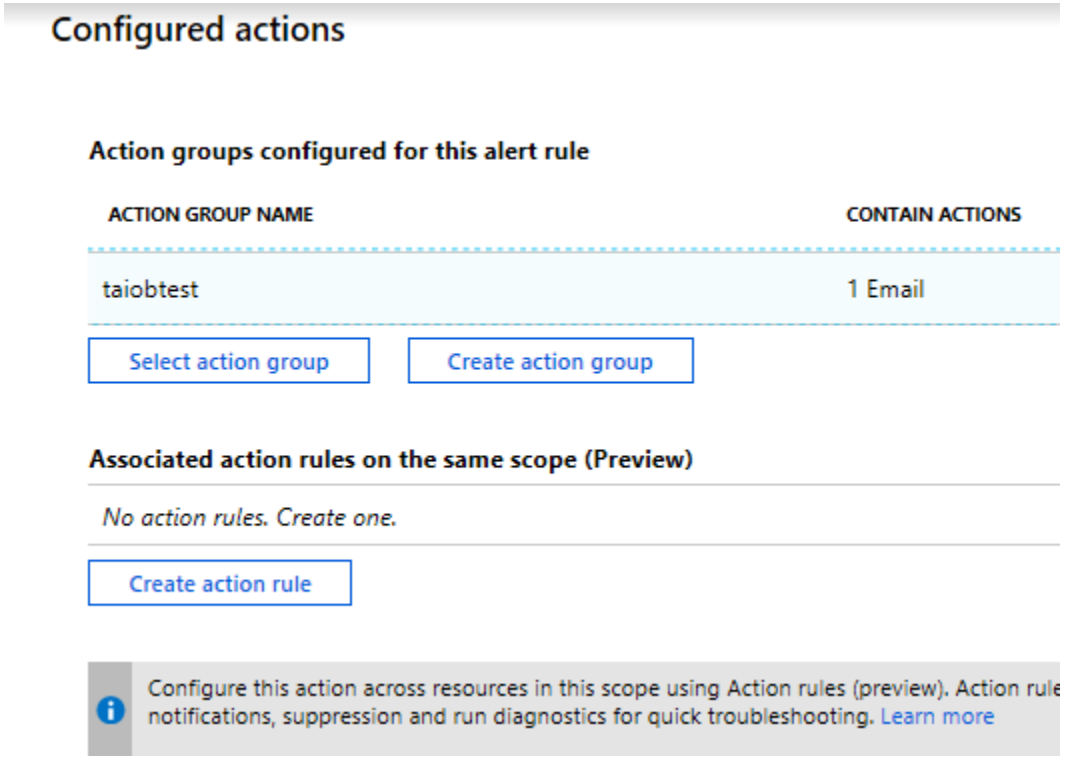

Last 24 hours (Automatic - 15 minutes)
Avg DTU percentage, Avg CPU percentage, and Avg Log IO percentage
Add metric
Add filter
Apply splitting
New alert rule
Pin to dashboard
taiobazdfdemo/taiobazdfde... DTU percentage, Avg
taiobazdfdemo/taiobazdfde... CPU percentage, Avg
taiobazdfdemo/taiobazdfde... Log IO percentage, Avg
3
RESOURCE
METRIC NAMESPACE
METRIC
AGGREGATION
taiobazdfdemo/taio...
Sql database standa...
Select metric
Select value(s)

Metrics

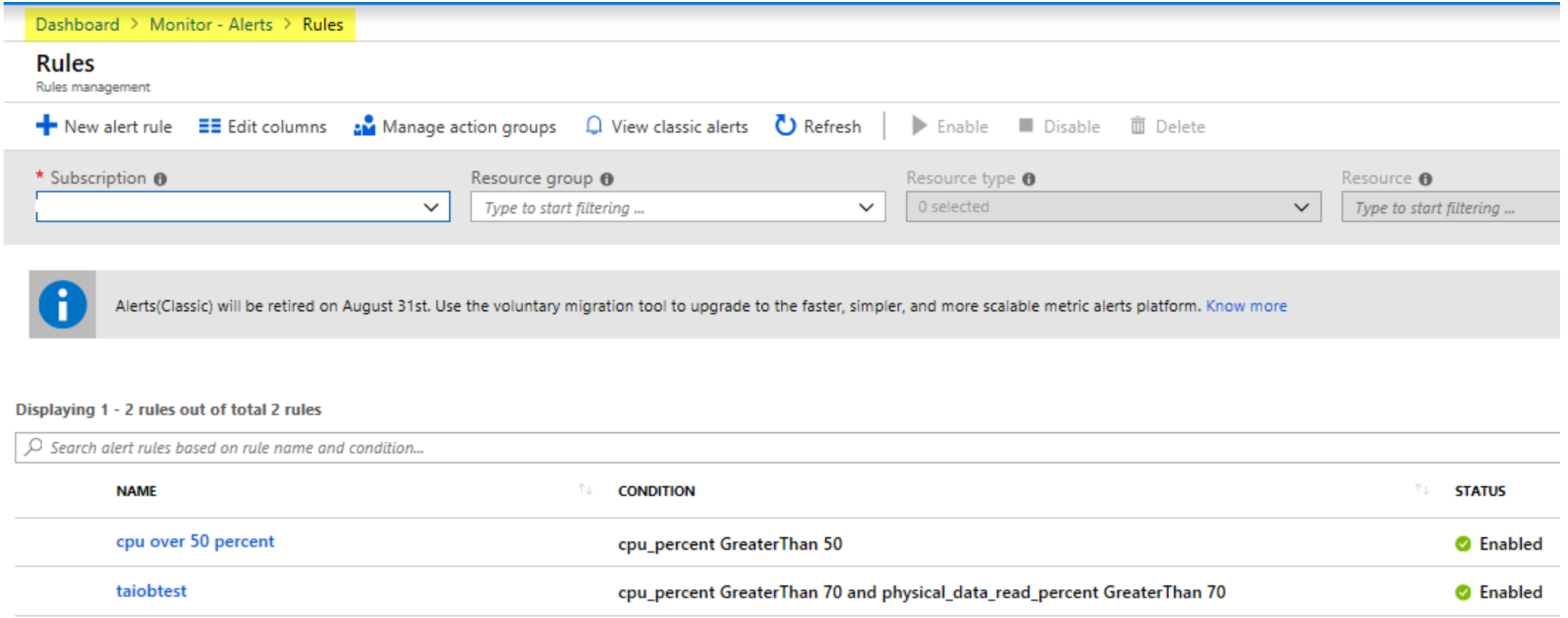

Last 30 minutes (Automatic - 1 minute)
Avg DTU Limit, Avg CPU percentage, and Max DTU percentage
Add metric
Add filter
Apply splitting
Area chart
New alert rule
Pin to dashboard
taiobazdfdemo/taiobazdfde... DTU Limit, Avg
taiobazdfdemo/taiobazdfde... CPU percentage, Avg
taiobazdfdemo/taiobazdfde... DTU percentage, Max
RESOURCE
taiobazdfdemo/taio...
METRIC NAMESPACE
Sql database standa...
METRIC
Select metric
AGGREGATION
Select value(s)
240
220
200
180
160
140
120
100
80
60
40
20
0
06 PM
Dec 26 06:01 PM
06:05
06:10
06:15
06:20
06:25
DTU Limit (Avg)
taiobazdfdemo
50
CPU percentage (Avg)
taiobazdfdemo
80.68 %
DTU percentage (Max)
taiobazdfdemo
82.24 %

Alert


Dashboard > Monitor - Alerts > Rules > cpu over 50 percent
cpu over 50 percent
Rules management
Save
Discard
Disable
Delete
* RESOURCE
HIERARCHY
taiobtest/stresstest
taiobtest
* CONDITION
Monthly cost in USD (Estimated)
Whenever the CPU percentage is Greater than 50 %
$ 0.10
Total $ 0.10
Add
ACTIONS
View configured actions
Add
ALERT DETAILS
* Alert rule name
cpu over 50 percent
Description
test
* Severity
Sev 3
It can take up to 10 minutes for a metric alert rule to become active.


Configured actions
Action groups configured for this alert rule
ACTION GROUP NAME
CONTAIN ACTIONS
taiobtest
1 Email
Select action group
Create action group
Associated action rules on the same scope (Preview)
No action rules. Create one.
Create action rule
Configure this action across resources in this scope using Action rules (preview). Action rule
notifications, suppression and run diagnostics for quick troubleshooting. Learn more

Alert


Dashboard > Monitor - Alerts > Rules
Rules
Rules management
New alert rule
Edit columns
Manage action groups
View classic alerts
Refresh
Enable
Disable
Delete
* Subscription
Resource group
Type to start filtering ...
Resource type
0 selected
Resource
Type to start filtering ...
Alerts(Classic) will be retired on August 31st. Use the voluntary migration tool to upgrade to the faster, simpler, and more scalable metric alerts platform. Know more
Displaying 1 - 2 rules out of total 2 rules
Search alert rules based on rule name and condition...
NAME
CONDITION
STATUS
cpu over 50 percent
cpu_percent GreaterThan 50
Enabled
taiobtest
cpu_percent GreaterThan 70 and physical_data_read_percent GreaterThan 70
Enabled

⚠ Your Azure Monitor alert was triggered

Azure monitor alert rule cpu over 50 percent was triggered for taiobtest at July 5, 2019 13:28 UTC.

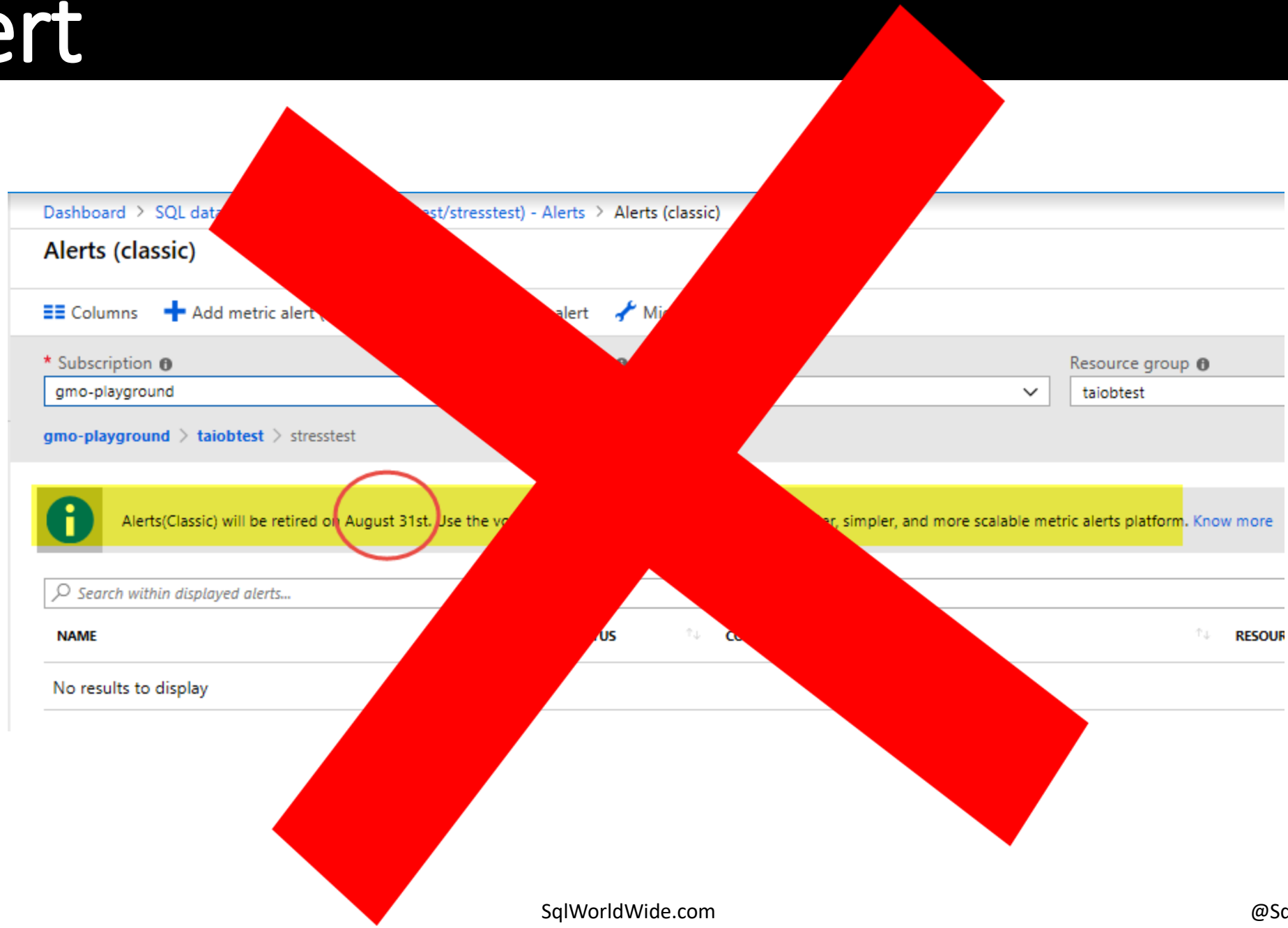
Alert rule description	test
Rule ID	/subscriptions/13181d92-5dac-4f76-993c-e0d9412517d9/resourceGroups/taiobtest/providers/microsoft.insights/metricAlerts/cpu%20over%2050%20percent View Rule >
Resource ID	/subscriptions/13181d92-5dac-4f76-993c-e0d9412517d9/resourceGroups/taiobtest/providers/Microsoft.Sql/servers/taiobtest/databases/stresstest View Resource >

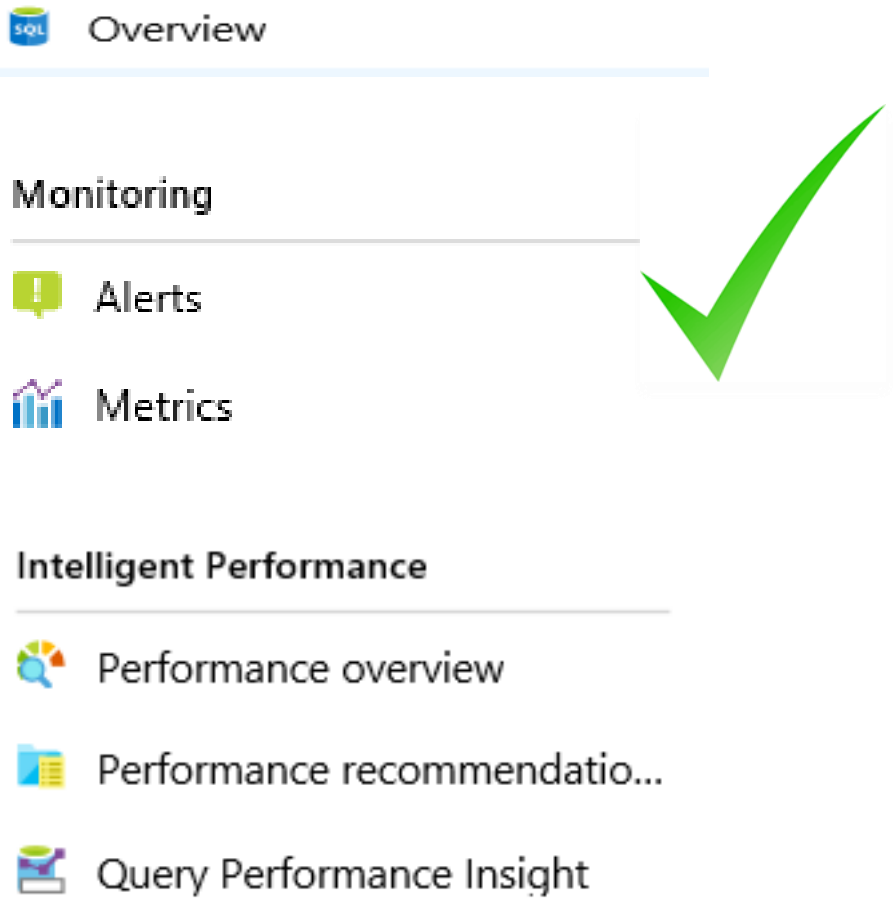
Alert Activated Because:

Metric name	cpu_percent
Metric namespace	servers/databases/taiobtest
Dimensions	microsoft.resourceId = /SUBSCRIPTIONS/13181D92-5DAC-4F76-993C-E0D9412517D9/RESOURCEGROUPS/TAIOBTEST/PROVIDERS/MICROSOFT.SQL/SERVERS/TAIOBTEST/DATABASES/STRESSTEST
Time Aggregation	Average
Period	Over the last 5 mins
Value	60.46885
Operator	GreaterThan
Threshold	50
Criterion Type	StaticThresholdCriterion

See in the Azure portal >

Alert

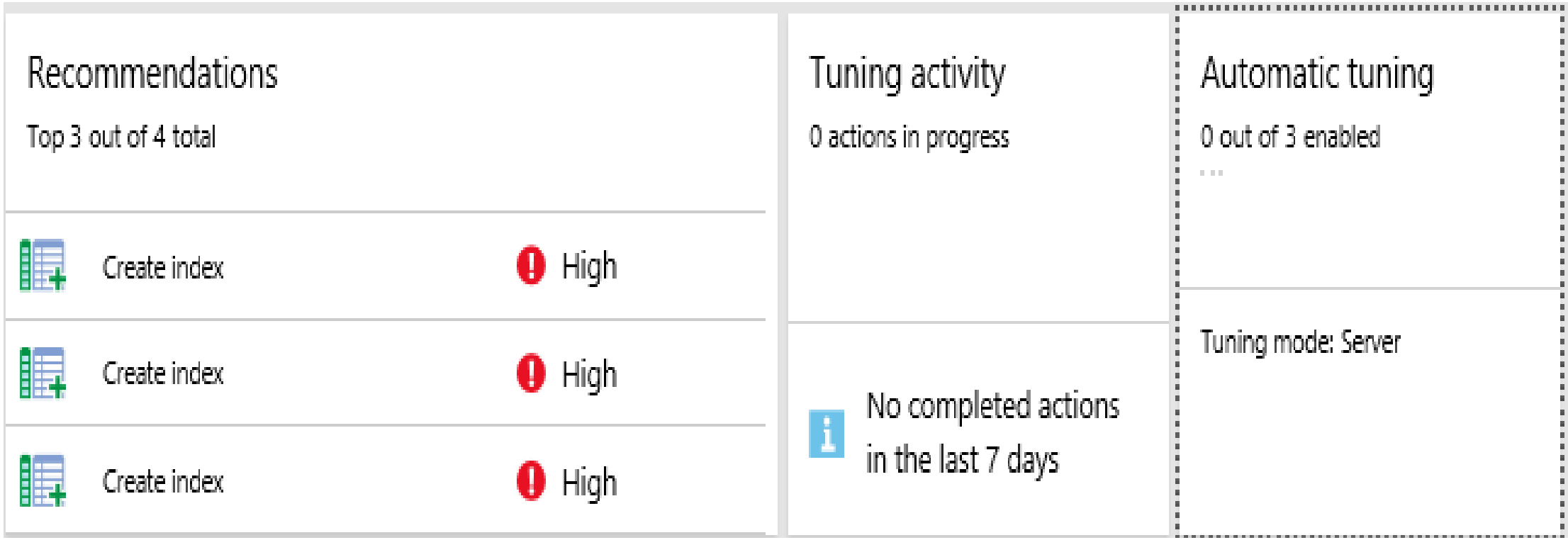

Dashboard > SQL data
est/stresstest) - Alerts > Alerts (classic)
Alerts (classic)
Columns
Add metric alert
alert
Mi
* Subscription
gmo-playground
Resource group
taiobtest
gmo-playground > taiobtest > stresstest
Alerts(Classic) will be retired on August 31st. Use the ve
r, simpler, and more scalable metric alerts platform. Know more
Search within displayed alerts...
NAME
US
RESOUR
No results to display



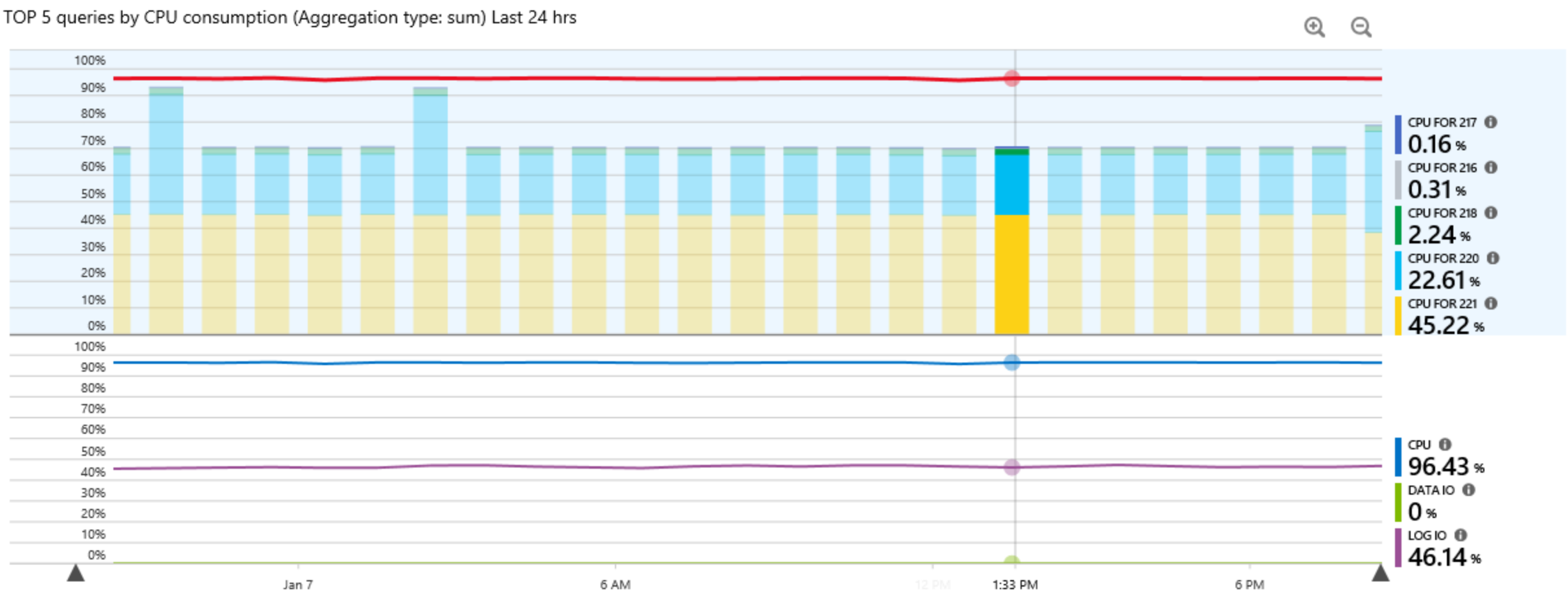
Automatic Tuning

Azure SQL Analytics

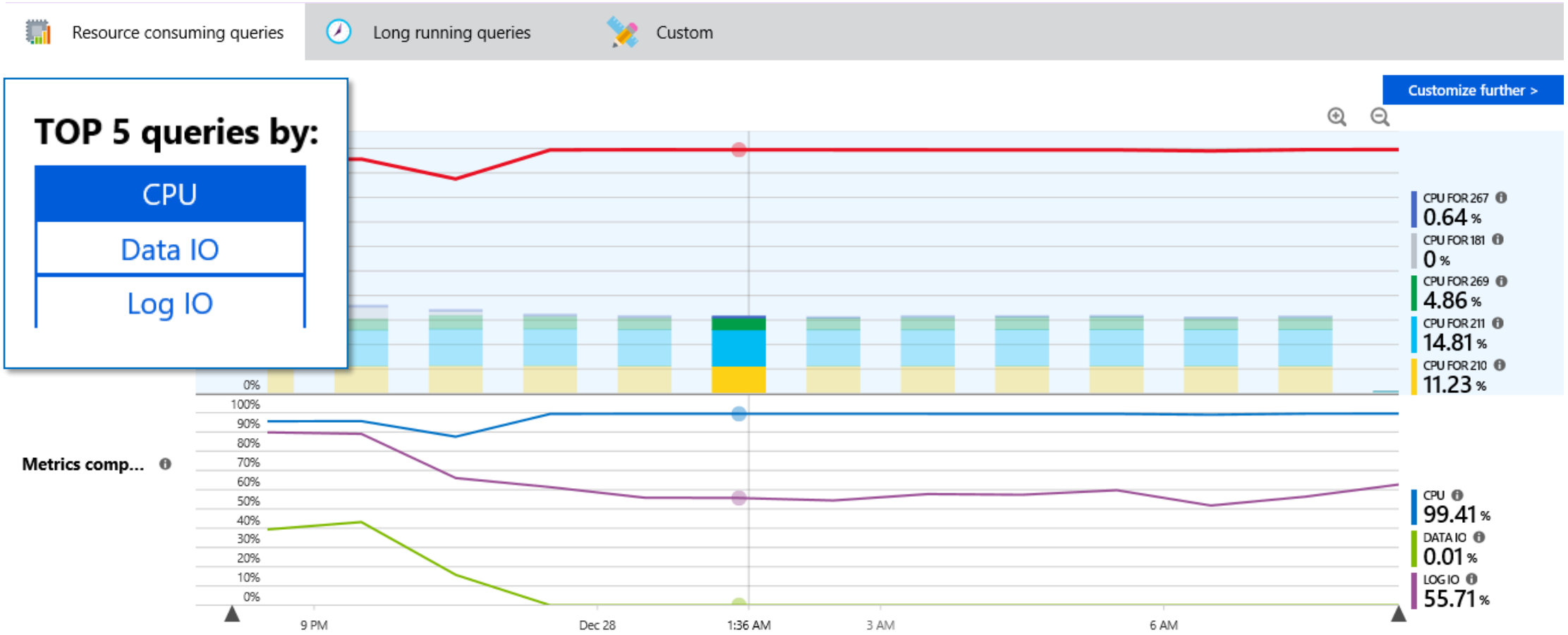
Performance Overview



Performance Overview



Query Performance Insight



Query Performance Insight

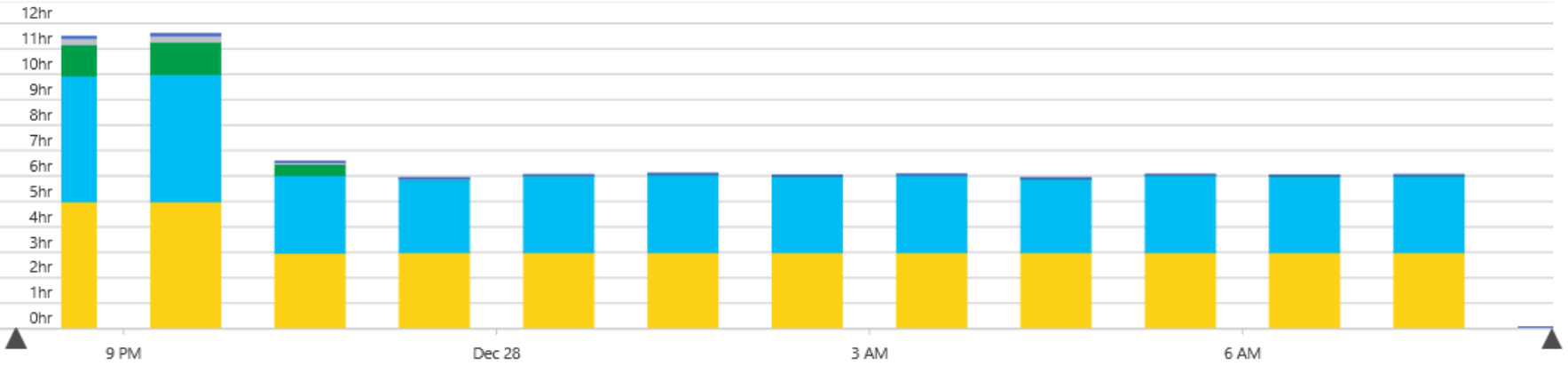
Resource consuming queries | Long running queries | Custom

TOP 5 queries by:
DURATION

Aggregation type:
SUM

Time period:
12/27/2018 8:10:46 PM
- 12/28/2018 8:10:46 AM

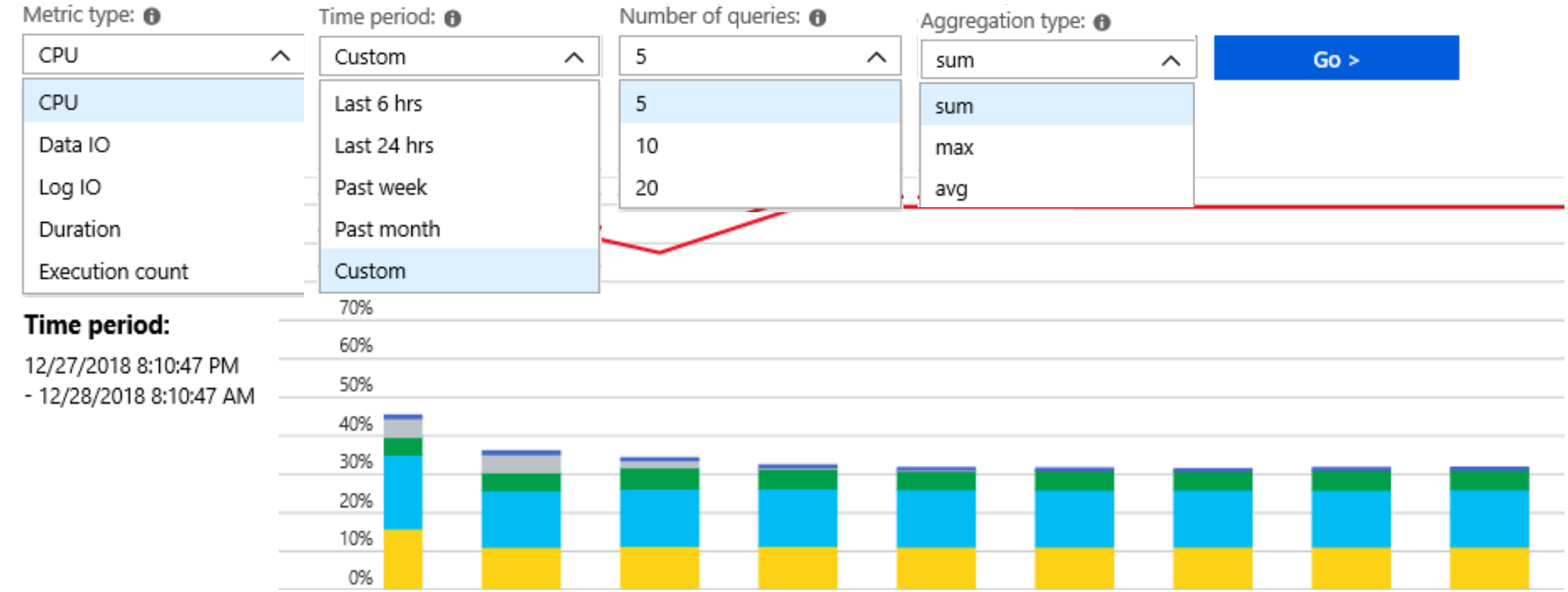
Customize fu



Click on a row below to get the details for the selected query.

QUERY ID	CPU[%]	DATA IO[%]	LOG IO[%]	DURATION[HH:MM:SS]	EXECUTIONS COUNT	#
211	14.1	0	0	39:56:48.709	134644	☑
210	10.74	0	0	39:56:29.339	762	☑
269	4.52	7.24	35.9	03:02:49.870	1692572	☑
181	0.93	0	5.58	00:34:00.89	436021	☑
190	0.61	0	0	00:28:36.289	2368	☑

Query Performance Insight



Top 5 Query

Click on a row below to get the details for the selected query.

QUERY ID	CPU[%]	DATA IO[%]	LOG IO[%]	DURATION[HH:MM:SS]	EXECUTIONS COUNT	#
211	14.1	0	0	39:56:48.709	134644	✓
210	10.74	0	0	39:56:29.339	762	✓
269	4.52	7.24	35.9	03:02:49.870	1692572	✓
181		0	5.58	00:34:00.89	436021	✓
267		0	0	00:01:04.519	1692571	✓

Single Query Details

Query details

taiobazdfdemo - Query ID 269

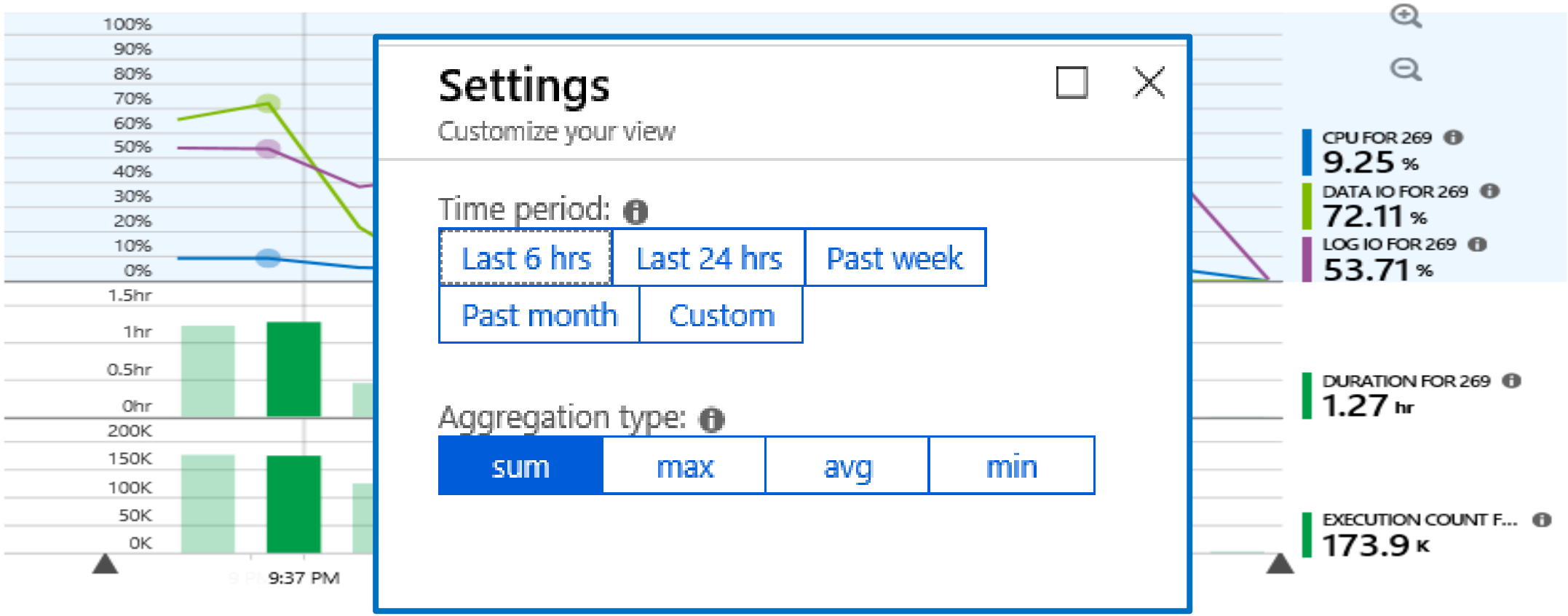
Settings | Refresh | Recommendations | Query Text

Query ID 269:

```
1  (@PK_ID bigint,@l_cola char(1),@l_colb char(1),@l_colc char(1),@l_cold char(1))UPDATE
   [dbo].[StressTestTable]
2     SET [ColA] = REPLICATE(@l_cola,2000)
3       ,[ColB] = REPLICATE(@l_colb,2000)
4       ,[ColC] = REPLICATE(@l_colc,2000)
5       ,[ColD] = REPLICATE(@l_cold,2000)
6   WHERE StressTestTableId = @PK_ID
```

Single Query Details

Details of Query ID 269 (Aggregation type: sum) 12/27/2018 8:02:44 PM - 12/28/2018 8:02:44 AM



INTERVAL	CPU[%]	DATA IO[%]	LOG IO[%]	DURATION[HH:MM:SS]	EXECUTIONS...
12/27/2018: 8:30:00 PM - NaN	9.28	65.55	54.07	01:13:31.779	175264

Performance Recommendation

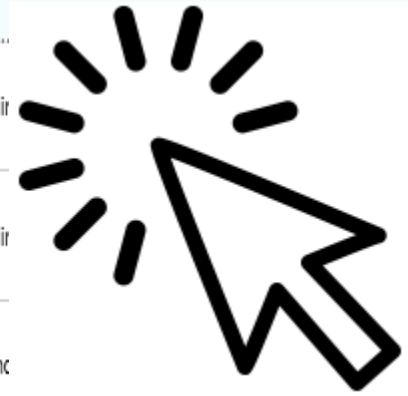
- **Create index**
- **Drop index**
- **Parameterize queries**

> ⓘ Important
>
> Microsoft is currently deprecating "Fix schema issue" recommendations. We recommend that you use Intelligent Insights to monitor your database performance issues, including schema issues that the "Fix schema issue" recommendations previously covered.

Performance Recommendation

Recommendations

ACTION	RECOMMENDATION DESCRIPTION	IMPACT
Create index	Table: [TransactionHistory] Indexed columns: [Quantity]	High
Create ir	Table: [TransactionHistoryArchive] Indexed columns: [Quantity]	High
Create ir	Table: [SalesOrderDetail] Indexed columns: [ProductID], [UnitPrice]	High
Drop inc	Index name: AK_Document_rowguid Reason: Duplicate index	Low



Tuning history

ACTION	RECOMMENDATION DESCRIPTION	STATUS	TIME
There are currently no operations to display. Once you apply a recommendation, its status will be displayed here.			

Create index

[Production].[TransactionHistory]

Apply | Discard | View script

Recomme		Last update	Initiated by
Create i Learn m		12/28/2018 5:04:24 AM	N/A

Estimat

Impac	High
Disk space needed	7.75 MB

Details

Index name	nci_wi_TransactionHistory_D704F71BA059FF71B017D
Index type	NONCLUSTERED
Schema	[Production]
Table	[TransactionHistory]
Index key columns	[Quantity]
Included columns	[ActualCost], [ModifiedDate], [ProductID], [Reference

Create index

[Production].[TransactionHistory]

Apply | Discard | View script

Database Advisor will start the process to create the recommended index...

☐ Automatically apply CREATE INDEX in the future

OK | Cancel

Recommendations

ACTION	RECOMMENDATION DESCRIPTION	IMPACT
Parameterize queries	Scope: Entire database Reason: Non-parameterized queries are causing performance issues	High

Parameterize queries

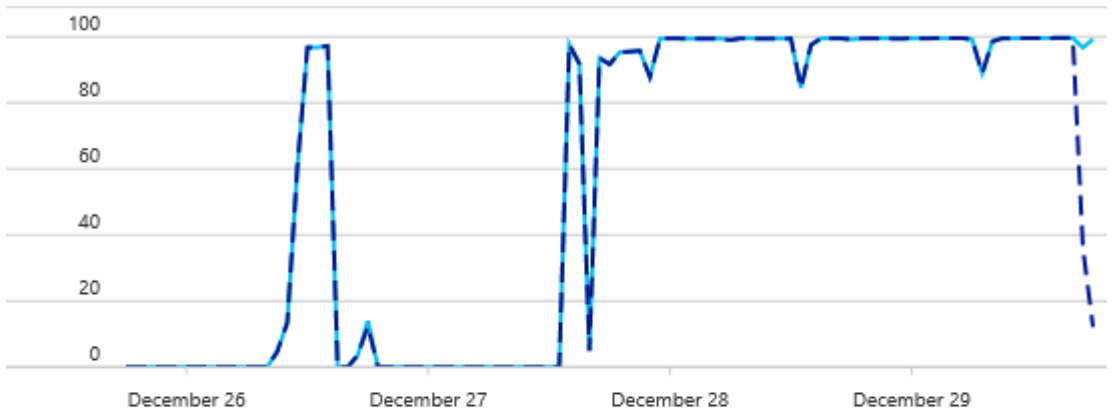
Cancel View script

Recommended action	Status	Last update	Initiated by
Parameterize queries Learn more	Pending	12/30/2018 5:24:24 PM	User

Estimated impact

Impact	High
CPU savings	2.42%
Query duration decrease	Up to 1.84 secs

Actual vs projected CPU



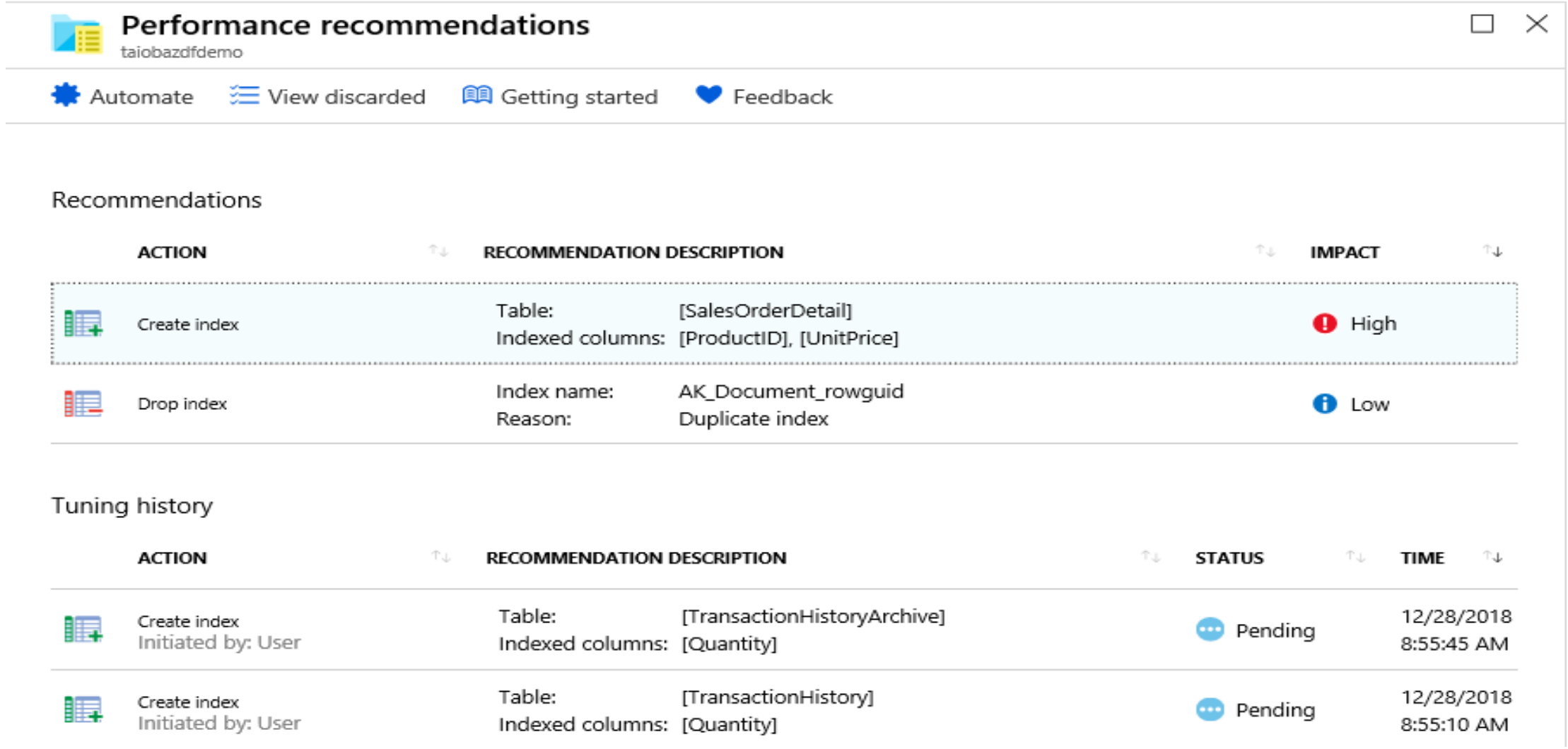
Actual % of CPU
56.54

Projected % of CPU
55

Details

Scope	Entire database
Reason	Non-parameterized queries are causing performan

Deployment Status



Deployment Status

Recommendations

ACTION	RECOMMENDATION DESCRIPTION	IMPACT
Drop index	Index name: AK_Document_rowguid Reason: Duplicate index	Low

Tuning history

ACTION	RECOMMENDATION DESCRIPTION	STATUS	TIME
Create index Initiated by: User	Table: [SalesOrderDetail] Indexed columns: [ProductID], [UnitPrice]	Validating	12/28/2018 2:20:32 PM
Create index Initiated by: User	Table: [TransactionHistoryArchive] Indexed columns: [Quantity]	Validating	12/28/2018 2:20:09 PM
Create index Initiated by: User	Table: [TransactionHistory] Indexed columns: [Quantity]	Validating	12/28/2018 2:17:21 PM

Deployment Status

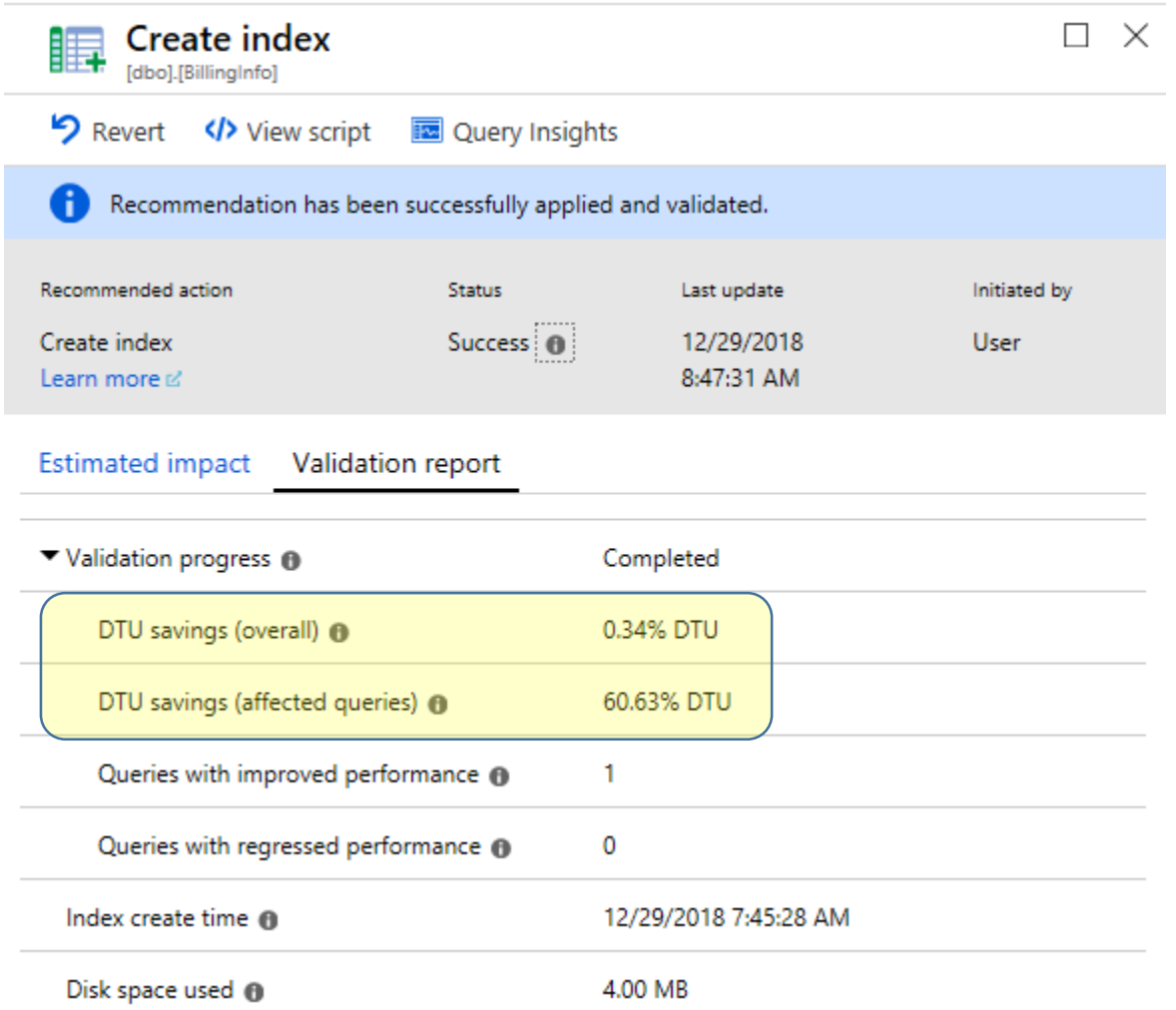
Tuning history

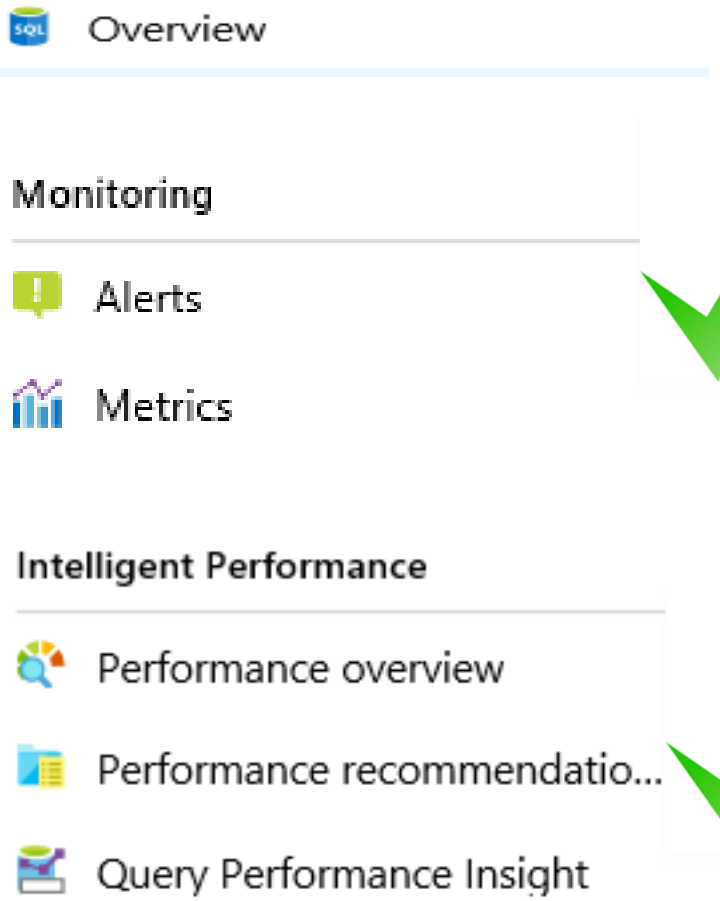
	ACTION	RECOMMENDATION DESCRIPTION			
	Create index Initiated by: User	Table: Indexed columns:	[BillingInfo] [BillingDate]		
	Error				
	Create index Initiated by: User	Table: Indexed columns:	[TransactionHistoryArchive] [Quantity]		7:50:29 PM
	Create index Initiated by: User	Table: Indexed columns:	[TransactionHistory] [Quantity]	Validating	12/28/2018 7:47:54 PM
	Create index Initiated by: System	Table: Indexed columns:	[SalesOrderDetail] [ProductID], [UnitPrice]	Reverted	12/28/2018 4:57:51 PM

If the index didn't improve performance, it's automatically reverted

Validation Report

RECOMMENDATION DESCRIPTION		STATUS
Table: Indexed columns:	[TransactionHistoryArchive] [Quantity]	Validating
Table: Indexed columns:	[TransactionHistory] [Quantity]	Validating
Table: Indexed columns:	[BillingInfo] [BillingDate]	Success
Index name: Reason:	AK_Document_rowguid Duplicate index	Error
Table: Indexed columns:	[SalesOrderDetail] [ProductID], [UnitPrice]	Reverted





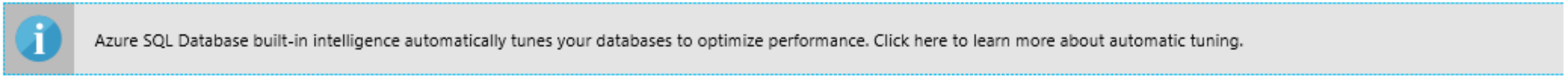
Automatic Tuning

Azure SQL Analytics

What Can Automatic Tuning do For You?

- Performance Tuning
- Verification
- Rollback and Self-Correction
- History
- Scale out
- Positive Impact on DevOps
- Lower Cost

Automatic Tuning



Inherit from:

Server | Azure defaults | Don't inherit

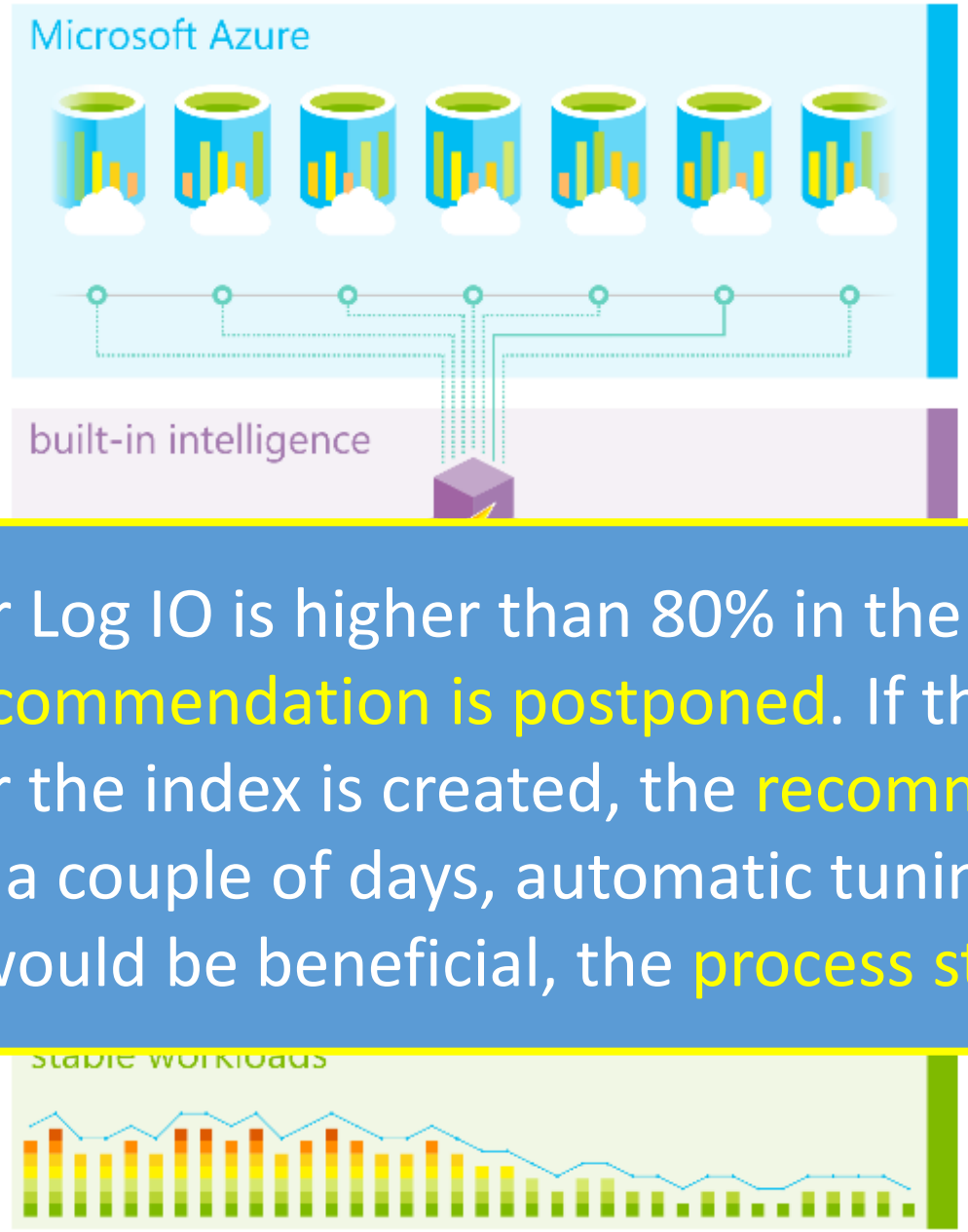
The database is inheriting automatic tuning configuration from the server. You can set the configuration to be inherited by going to: Server tuning settings

The database is inheriting settings from the server, but the server is in the unspecified state. Please specify the automatic tuning state on the server.

Configure the automatic tuning options

OPTION	DESIRED STATE	CURRENT STATE
FORCE PLAN	ON OFF INHERIT	OFF Inherited from server
CREATE INDEX	ON OFF INHERIT	OFF Inherited from server
DROP INDEX	ON OFF INHERIT	OFF Inherited from server

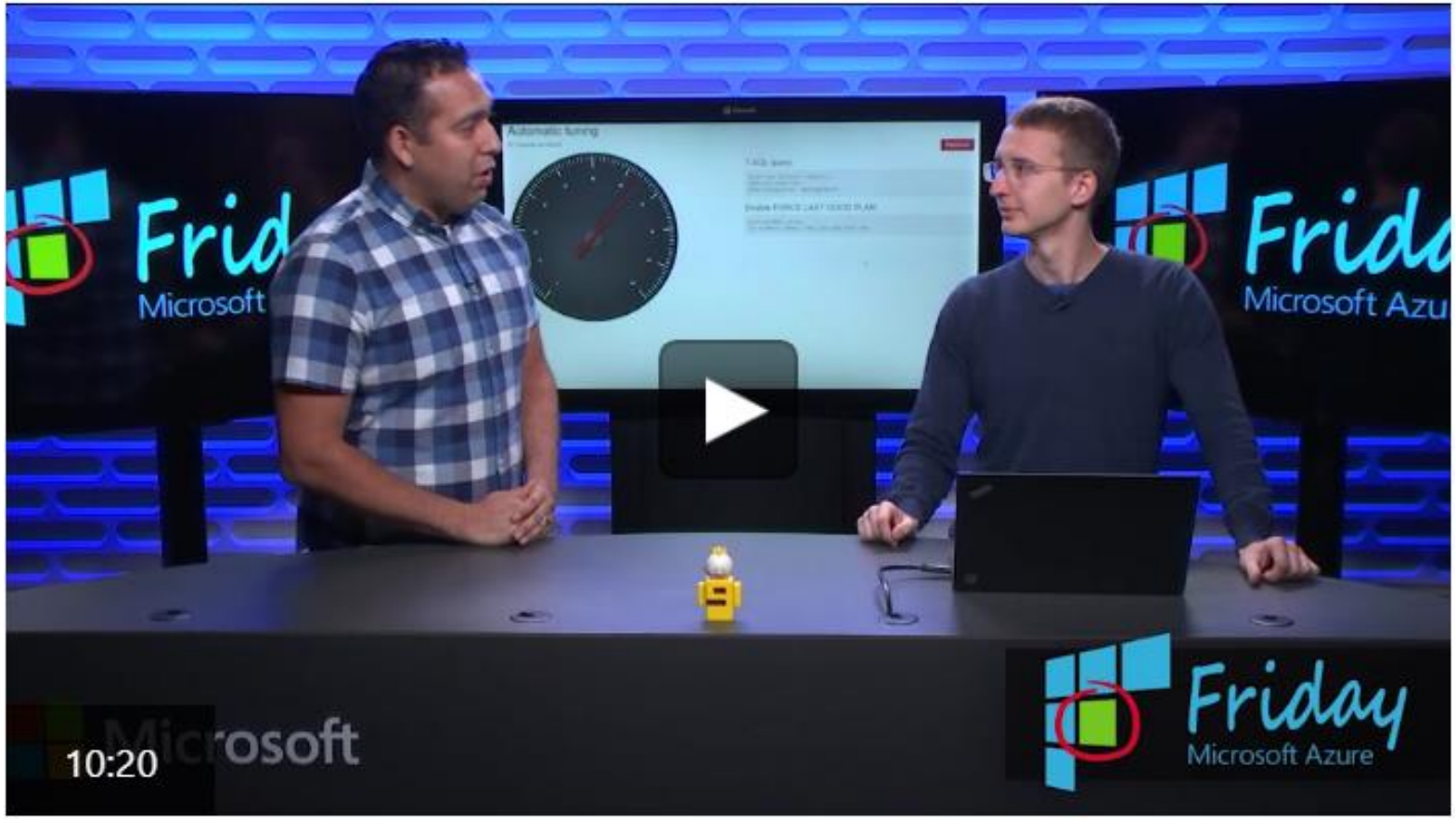
https://docs.microsoft.com/en-us/azu

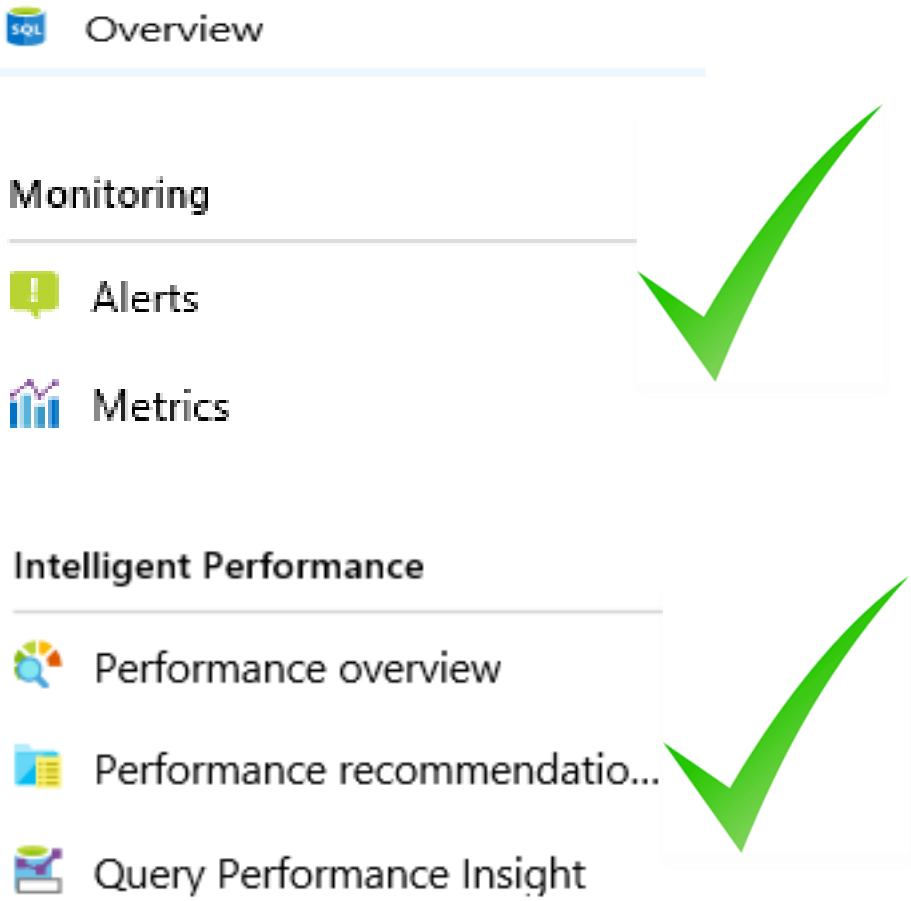


ning

If CPU, Data IO, or Log IO is higher than 80% in the previous 30 minutes, the create index recommendation is postponed. If the available storage will be below 10% after the index is created, the recommendation goes into an error state. If, after a couple of days, automatic tuning still believes that the index would be beneficial, the process starts again.

For an overview of how automatic tuning works and for typical usage scenarios, see the embedded video



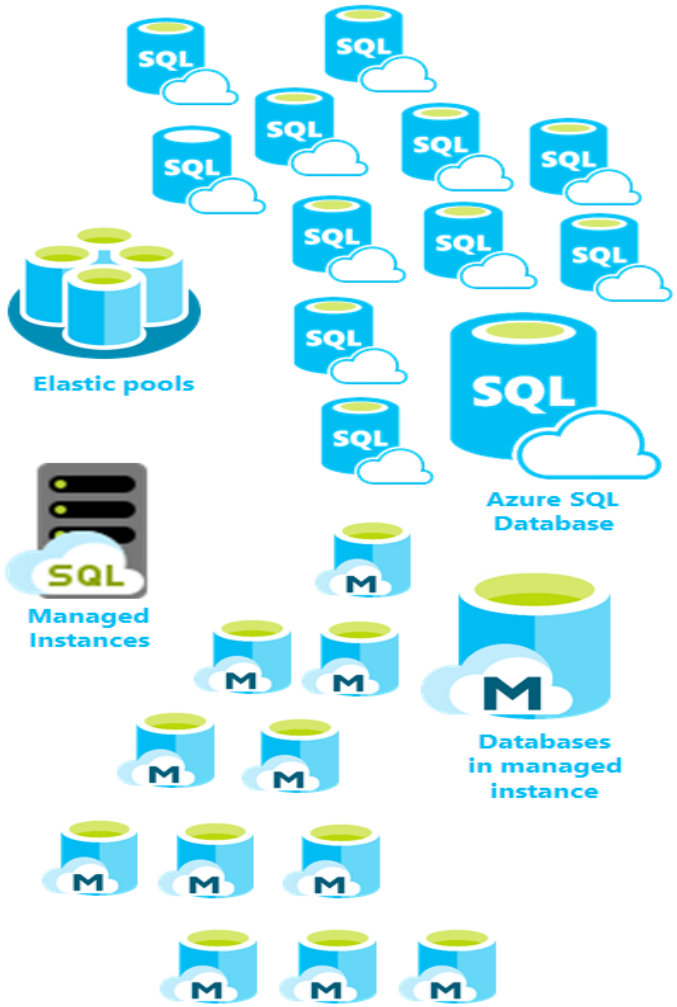


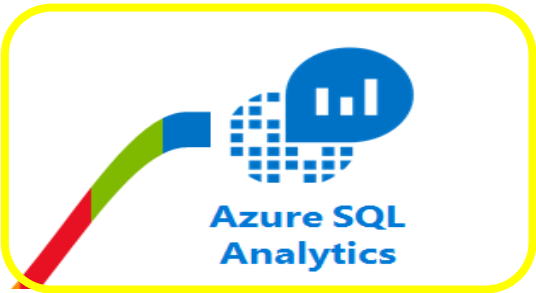
Automatic Tuning

Azure SQL Analytics

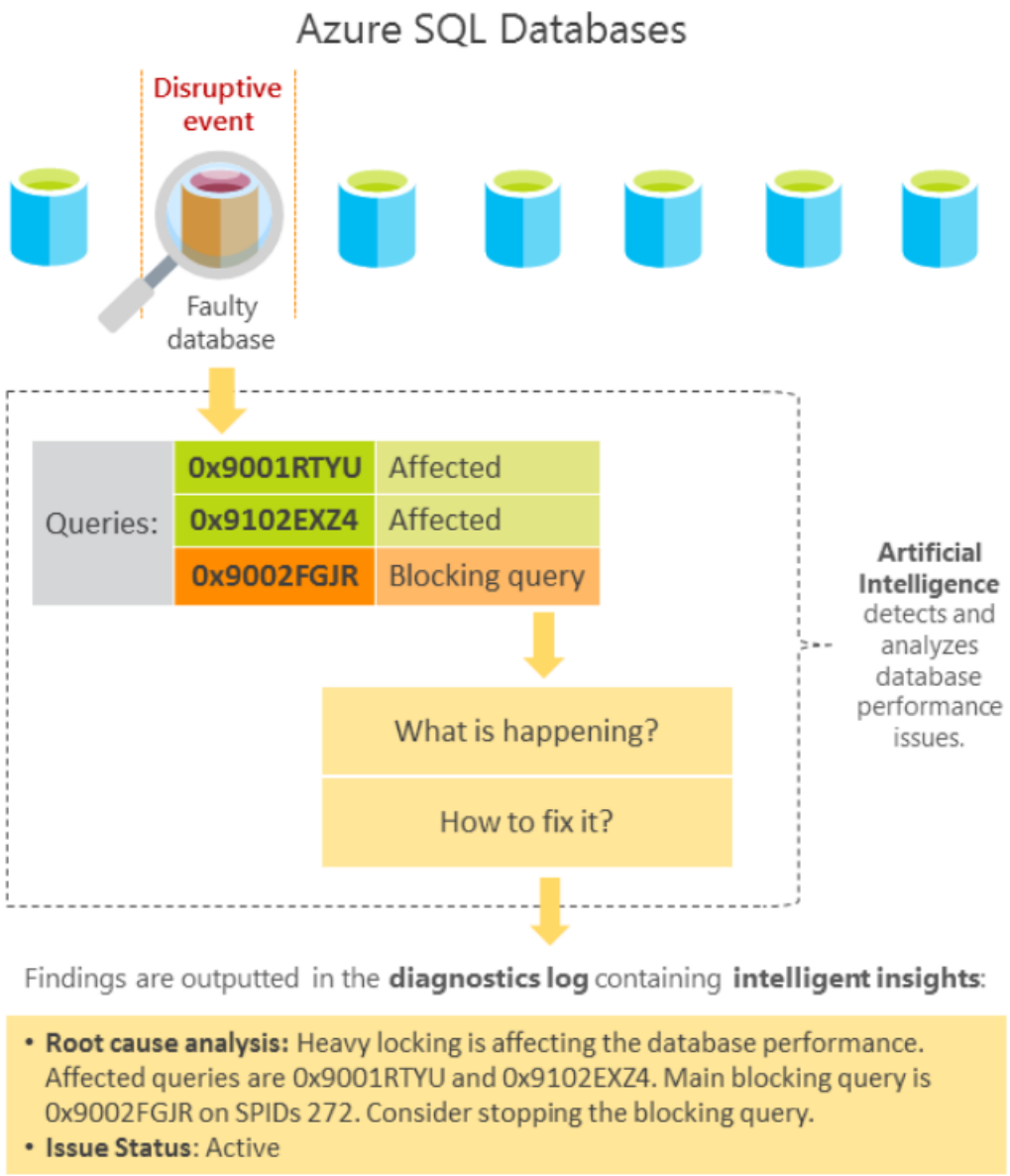
What Can Intelligent Insight do For You?

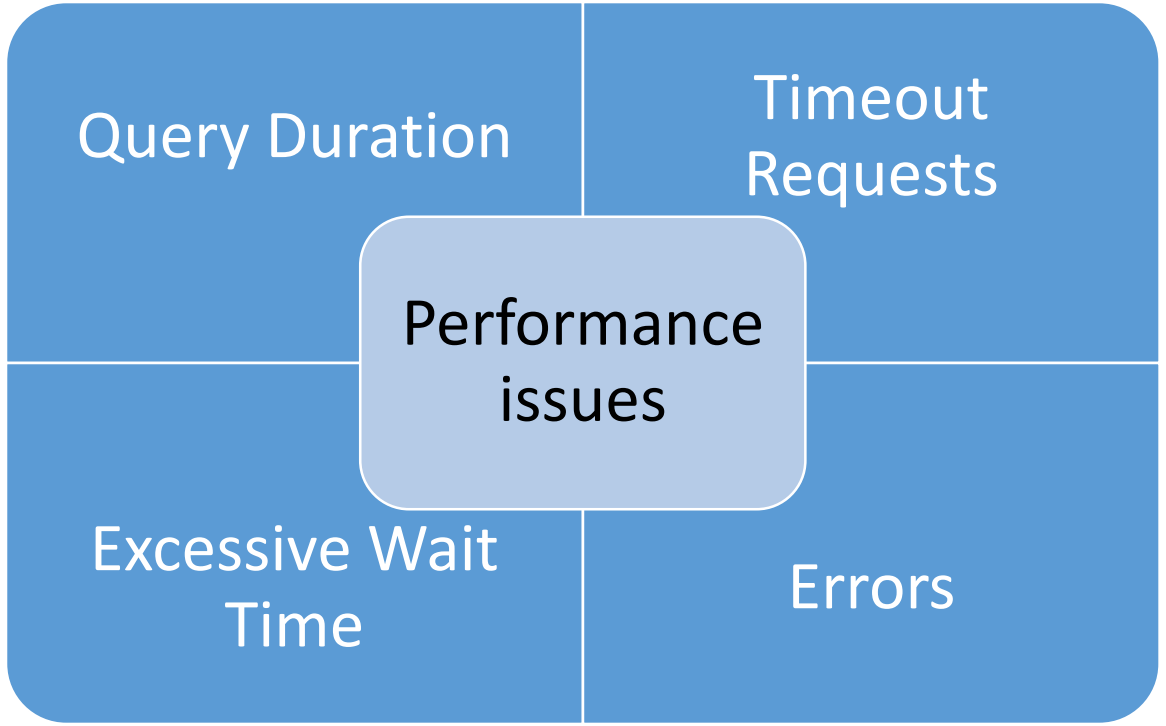
- Proactive monitoring
- Early detection of performance degradation
- Root cause analysis
- Performance improvement recommendations
- Scale out deployment
- Positive impact to DevOps resources





https://docs.microsoft.com/en-us/azure/sql-database/sql-database-metrics-diag-logging





https://docs.microsoft.com/en-us/azure/sql-database/sql-database-intelligent-insights

Detectable Performance Patterns

Reaching Resource Limit

Pagelatch Contention

Memory Pressure

Workload Increase

TempbDB Contention

New Query

Increased Maxdop

Increased Wait Statistics

Locking

Plan Regression

Azure SQL Analytics

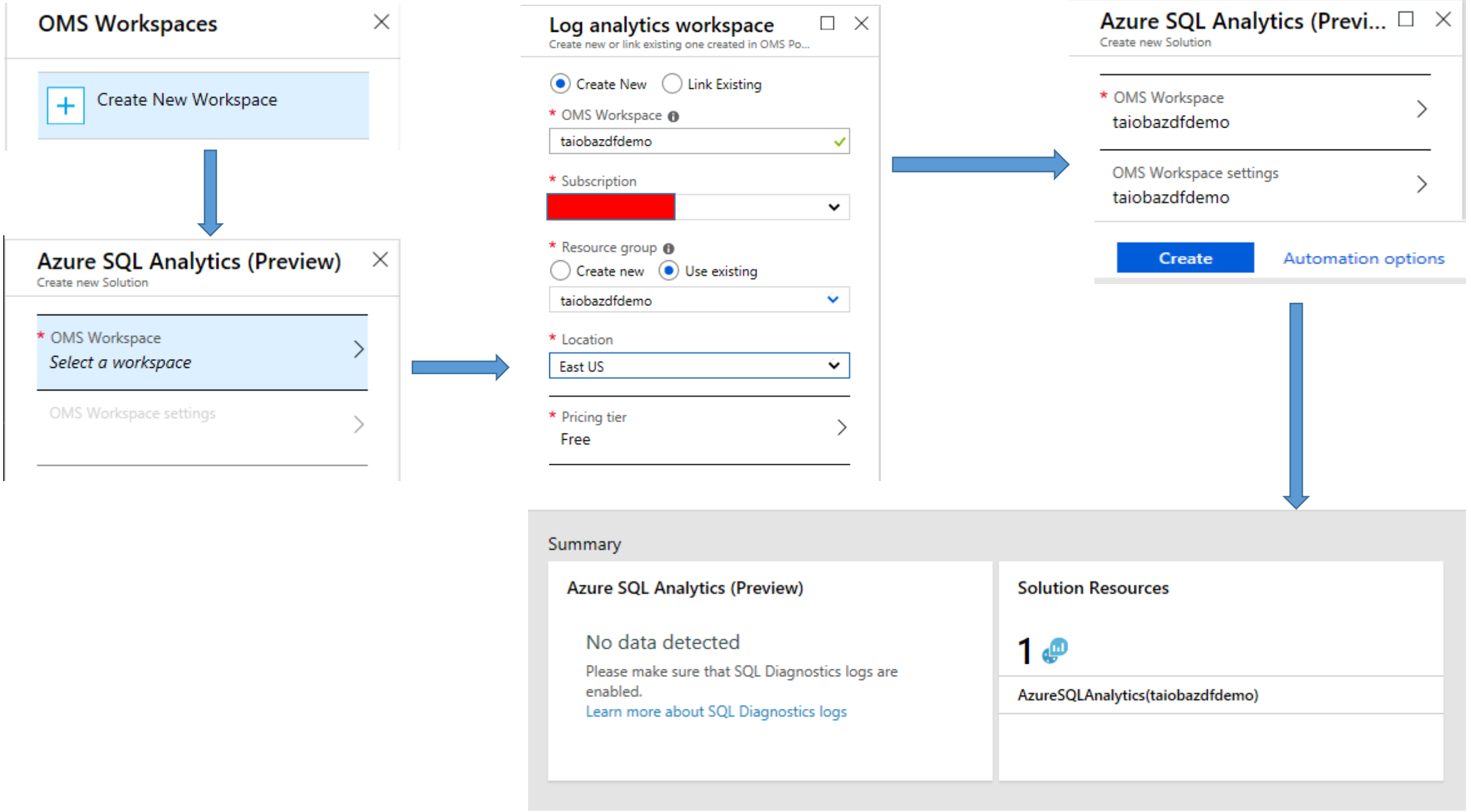
Intelligent performance monitoring

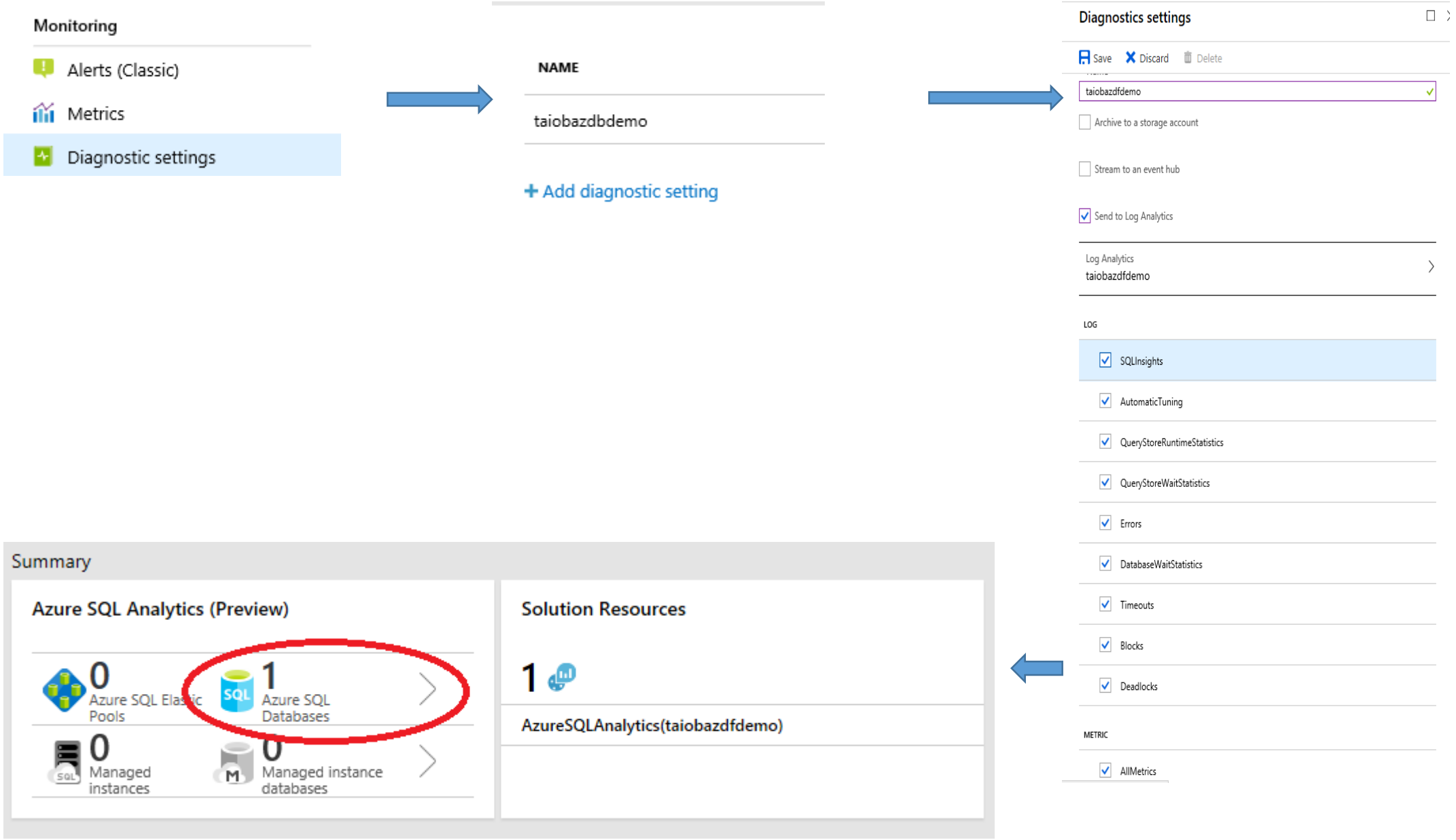
Telemetry stored for 30* days

Log Analytics queries

Custom Alerting

Performance monitoring dashboard

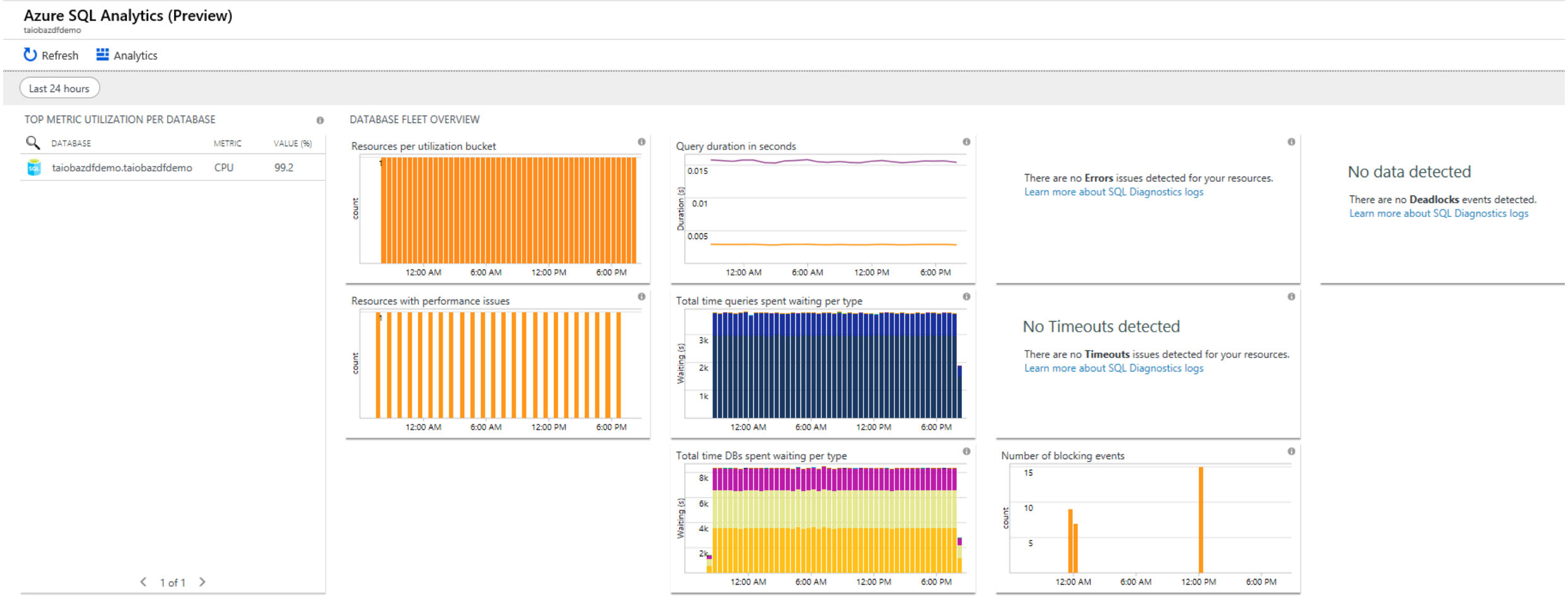

OMS Workspaces
Create New Workspace
Azure SQL Analytics (Preview)
Create new Solution
* OMS Workspace
Select a workspace
OMS Workspace settings
Log analytics workspace
Create new or link existing one created in OMS Po...
Create New
Link Existing
* OMS Workspace
taiobazdfdemo
* Subscription
* Resource group
Create new
Use existing
taiobazdfdemo
* Location
East US
* Pricing tier
Free
Azure SQL Analytics (Previ...
Create new Solution
* OMS Workspace
taiobazdfdemo
OMS Workspace settings
taiobazdfdemo
Create
Automation options
Summary
Azure SQL Analytics (Preview)
No data detected
Please make sure that SQL Diagnostics logs are enabled.
Learn more about SQL Diagnostics logs
Solution Resources
1
AzureSQLAnalytics(taiobazdfdemo)


Monitoring
Alerts (Classic)
Metrics
Diagnostic settings
NAME
taiobazdbdemo
+ Add diagnostic setting
Diagnostics settings
Save
Discard
Delete
taiobazdfdemo
Archive to a storage account
Stream to an event hub
Send to Log Analytics
Log Analytics
taiobazdfdemo
LOG
SQLInsights
AutomaticTuning
QueryStoreRuntimeStatistics
QueryStoreWaitStatistics
Errors
DatabaseWaitStatistics
Timeouts
Blocks
Deadlocks
METRIC
AllMetrics
Summary
Azure SQL Analytics (Preview)
0
Azure SQL Elastic Pools
1
Azure SQL Databases
0
Managed instances
0
Managed instance databases
Solution Resources
1
AzureSQLAnalytics(taiobazdfdemo)

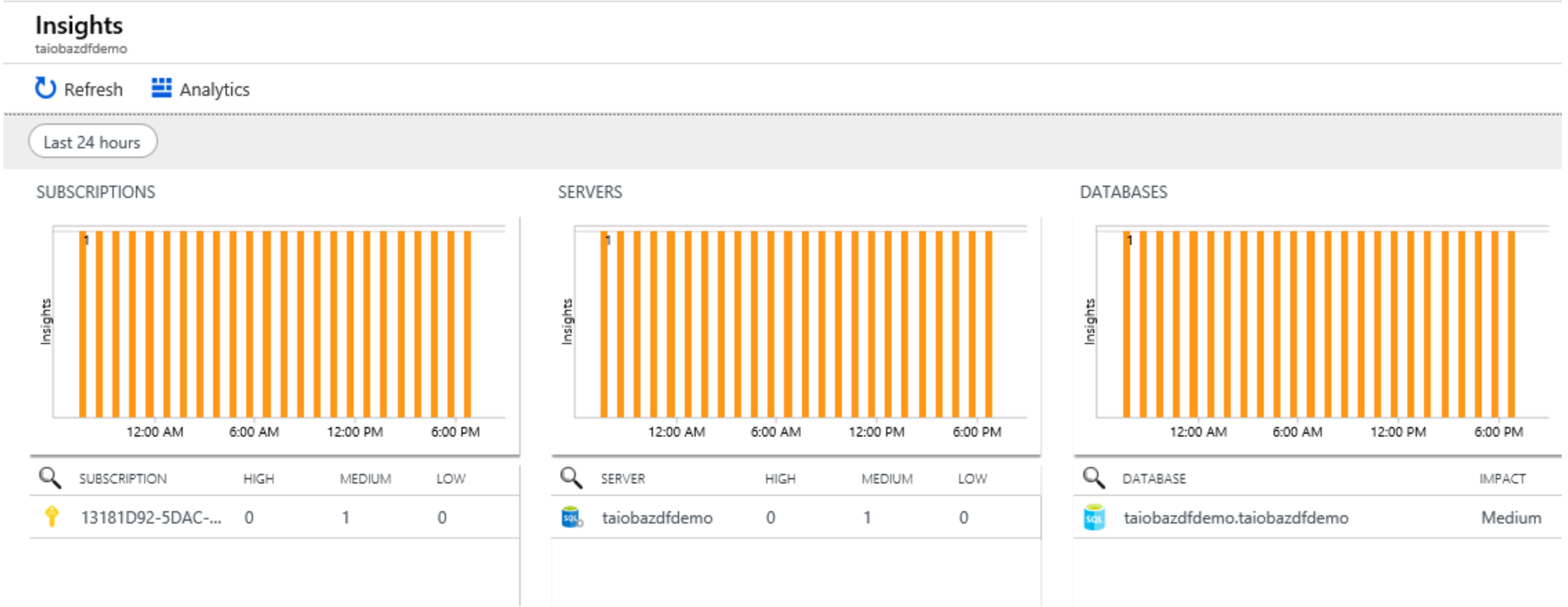
```
//looking if average cpu consumption was at 90% in last 10 minutes
let time_range = 10m;
let alert_threshold = 90;
AzureMetrics
| where ResourceProvider=="MICROSOFT.SQL"
| where ResourceId contains "/DATABASES/"
| where MetricName=="cpu_percent"
| where TimeGenerated > ago(1h)
| summarize AggregatedValue = avg(Average) by ResourceId, bin(TimeGenerated, time_range)
| where AggregatedValue >alert_threshold

//Deadlock details
AzureDiagnostics
| where Category =="Deadlocks"
| where TimeGenerated > ago(30d)
| project SourceSystem , TimeGenerated , Type , ResourceProvider , Category ,
  OperationName , Resource , ResourceType , SubscriptionId , ResourceGroup ,
  LogicalServerName_s , database_name_s , _ResourceId ,   deadlock_xml_s

```



Top metric utilization per database



Insights Across Enterprise (Hierarchy)

Database

taiobazdfdemo

Refresh | Analytics

Last 24 hours

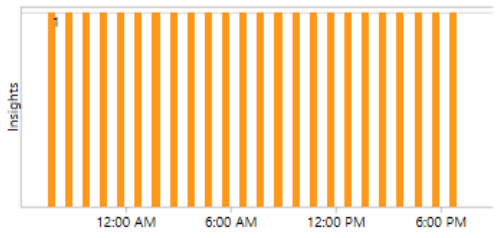
RESOURCE INFO

Subscription name:
13181d92-5dac-4f76-993c-e0d9412517d9

Server name:
taiobazdfdemo

Database name:
taiobazdfdemo

INSIGHTS SUMMARY



View full insights report

Summary

Start: 2019-01-07T01:00:00Z

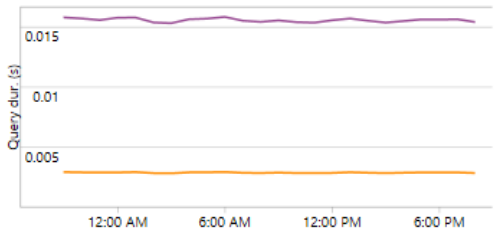
Worst: 2019-01-08T00:00:00Z

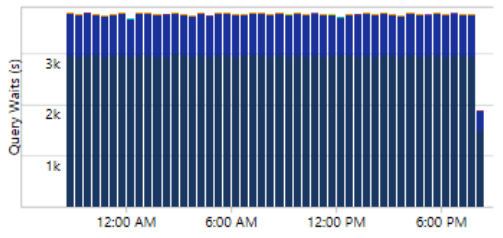
The database is hitting its CPU limits. Average consumption has reached 99.2%.

Last Update: 2019-01-08T00:00:00Z

The database is hitting its CPU limits. Average consumption has reached 99.2%.

QUERIES

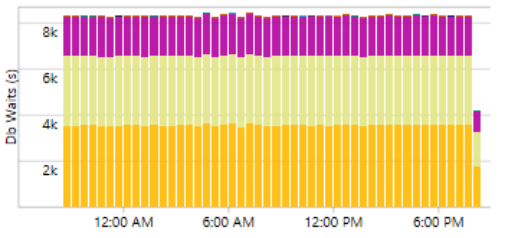




QUERY	METRIC	MAX (S)	AVG (S)	CPU (S)	DOMINANT WAIT	MAX (S)	AVG (S)	EXECS
0x1DEFDCE5DD87FFE0	Duration	47.2	29.8	5.38	CPU	41.6	24.5	2.87k
0xB299028E3365B898	Duration	0.591	0.493	0.058		0	0	3
0x8E8684D953B01986	Duration	0.895	0.462	0.059		0	0	6
0x261F6E6031F548FC	Duration	2.45	0.23	0.042	CPU	2.41	0.188	372k
0x8D290BAE42880245	Duration	0.919	0.168	0.022	CPU	0.896	0.146	1.42k
0xECD9DC0D65D8429E	Duration	0.532	0.154	0.017		0	0	9
0x9EDD66696E897F21	Duration	1.52	0.009	0.001	CPU	0.922	0.029	16.5k
0xC824056576DF9785	Duration	0.049	0.003	0	CPU	0.048	0.026	24
0x38B887E6006DAC8E	Duration	0.001	0.001	0.001		0	0	3
0x41ED1CD4BB2078EA	Duration	0.001	0.001	0.001		0	0	7

< 1 of 3 >

DATABASE WAITS



WAIT TYPE	TOTAL (S)
WAITFOR	168k
SOS_SCHEDULER_YIELD	143k
WRITELOG	83.7k
MEMORY_ALLOCATION_EXT	32.5
PAGEIOLATCH_SH	7.98
RESERVED_MEMORY_ALLOCATION_EXT	5.27
PAGEIOLATCH_EX	5.18
PAGEIOLATCH_UP	4.69
PREEMPTIVE_HTTP_REQUEST	0.731
PREEMPTIVE_OS_GETDISKFREESPACE	0.4

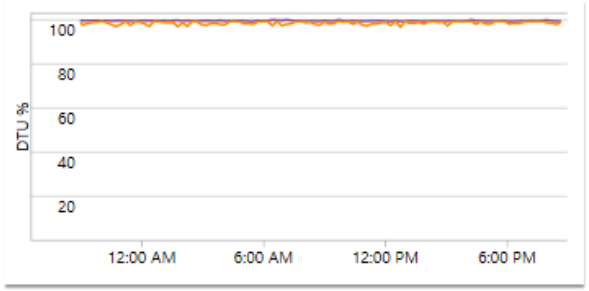
< 1 of 2 >

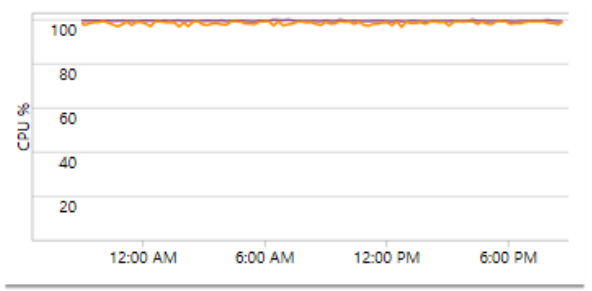
Insight Per Resource (Database)

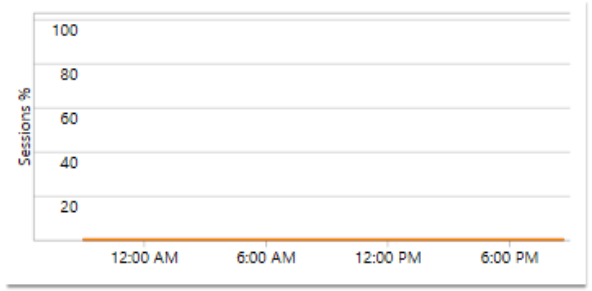
DATABASE METRICS

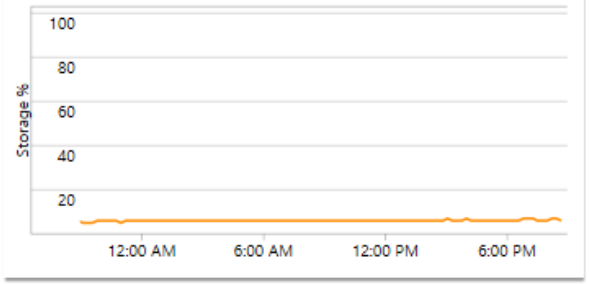
METRIC	MAX	80TH PERCE...	AVG
storage [GB]	0.711	0.699	0.478
dtu_consumption_...	100	99.8	96.3
cpu_percent	100	99.8	96.3
log_write_percent	60.4	59.8	46.4
dtu_limit	50	50	50
dtu_used	50	49.9	48.2
storage_percent	7	6	5.88
workers_percent	4.17	4.17	4.17
sessions_percent	0.416	0.416	0.416
physical_data_read...	0.083	0	0
connection_failed	0	0	0
connection_succes...	0	0	0
xtp_storage_percent	0	0	0
blocked_by_firewall	0	0	0
deadlock	0	0	0

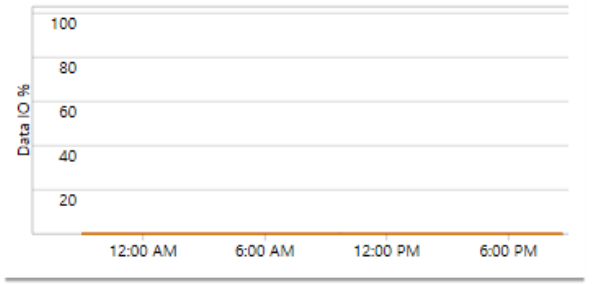
1 of 1

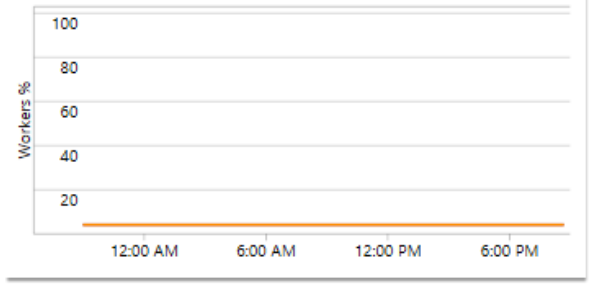


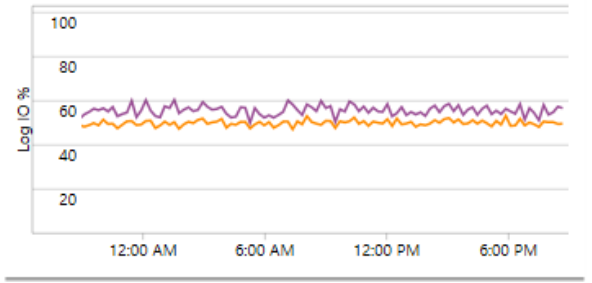












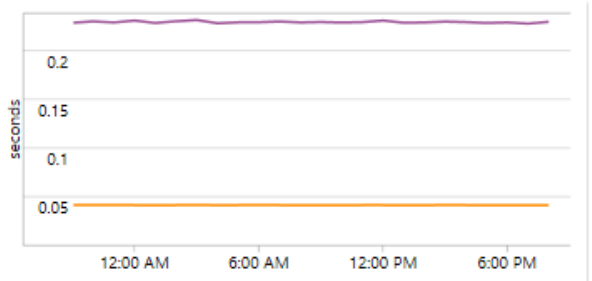
Insight Per Resource (Database)

QUERY TEXT

Query hash: 0x261F6E6031F548FC

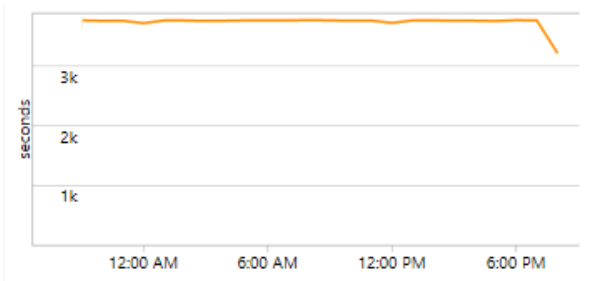
```
1  SELECT * FROM Production.TransactionHistory th
2  INNER JOIN Production
       .TransactionHistoryArchive tha ON th
       .Quantity = tha.Quantity
3  Where tha.TransactionDate>'2012-12-24'
4  AND tha.TransactionDate<'2013-01-02'
5  and tha.Quantity>100
```

DURATION



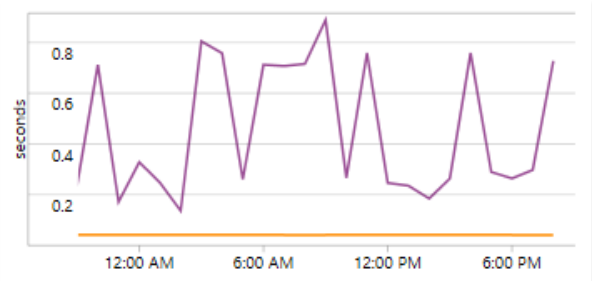
DATABASE	MAX (S)	AVG (S)	CPU (S)	EXECS
taiobazdfdemo.taioba...	2.45	0.23	0.042	372k

WAITS DURATION



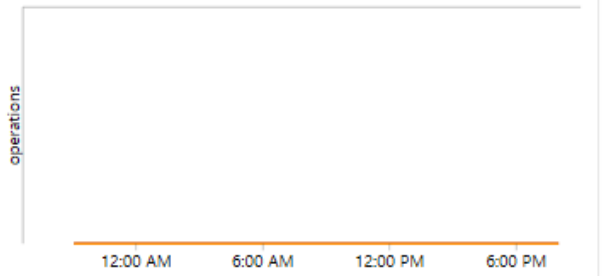
DATABASE	WAIT CATEGORY	AVG (S)
taiobazdfdemo.taioba...	CPU	0.188
taiobazdfdemo.taioba...	UNKNOWN	0.052
taiobazdfdemo.taioba...	MEMORY	0

CPU



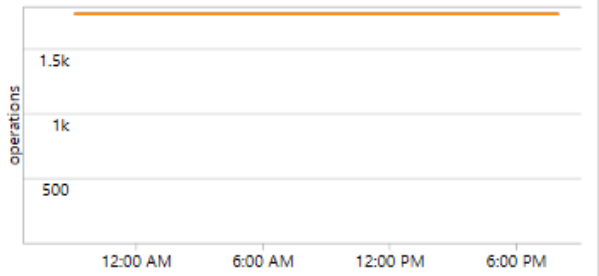
DATABASE	MAX (S)	AVG (S)	CPU (S)	EXECS
taiobazdfdemo.taioba...	0.889	0.042	372k	-

DATA IO



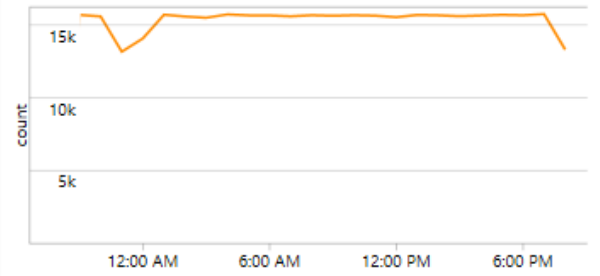
DATABASE	MAX	AVG	EXECS
taiobazdfdemo.tai...	0	0	372k

LOG IO



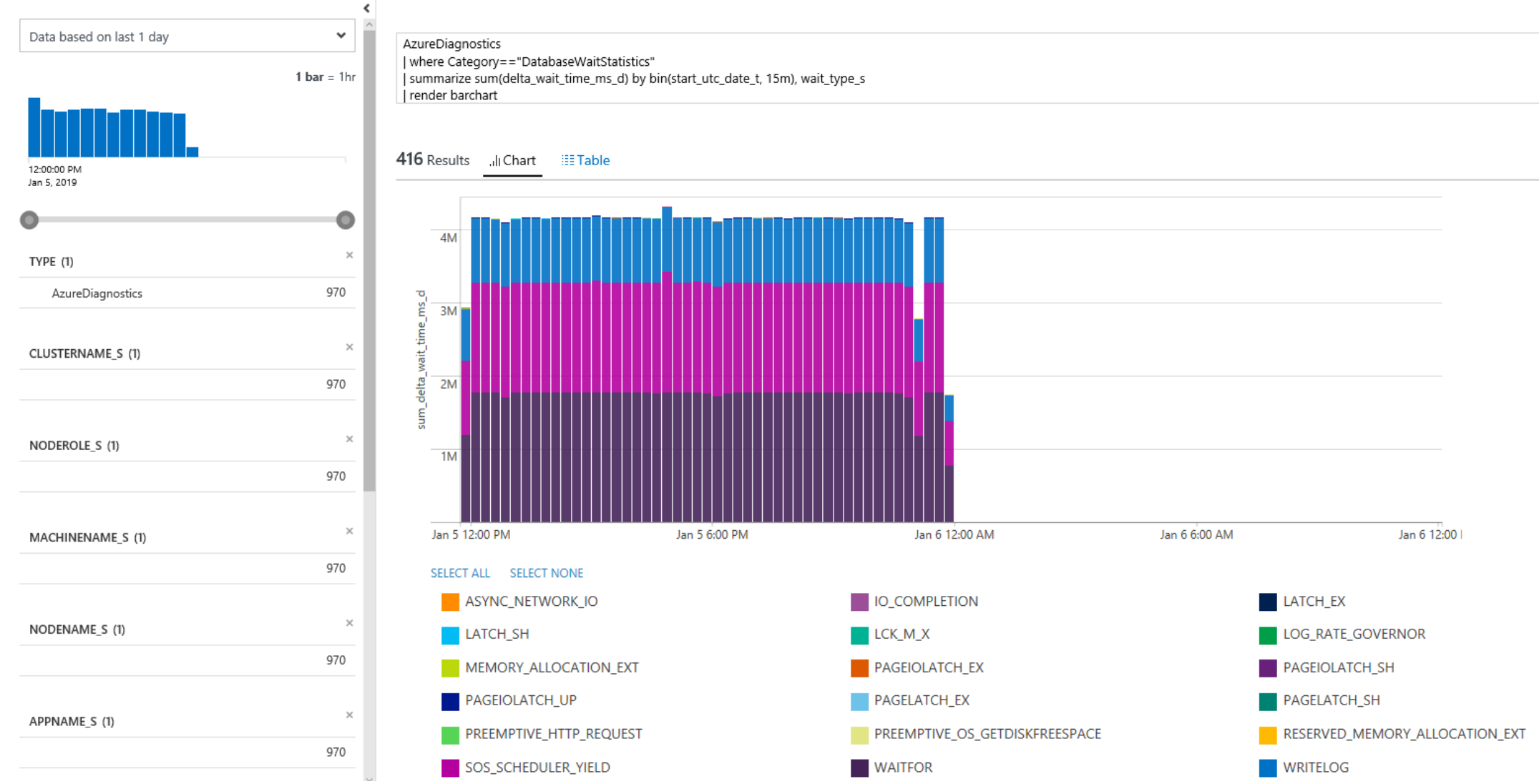
DATABASE	MAX	AVG	EXECS
taiobazdfdemo.tai...	1.77k	1.77k	372k

EXECUTIONS

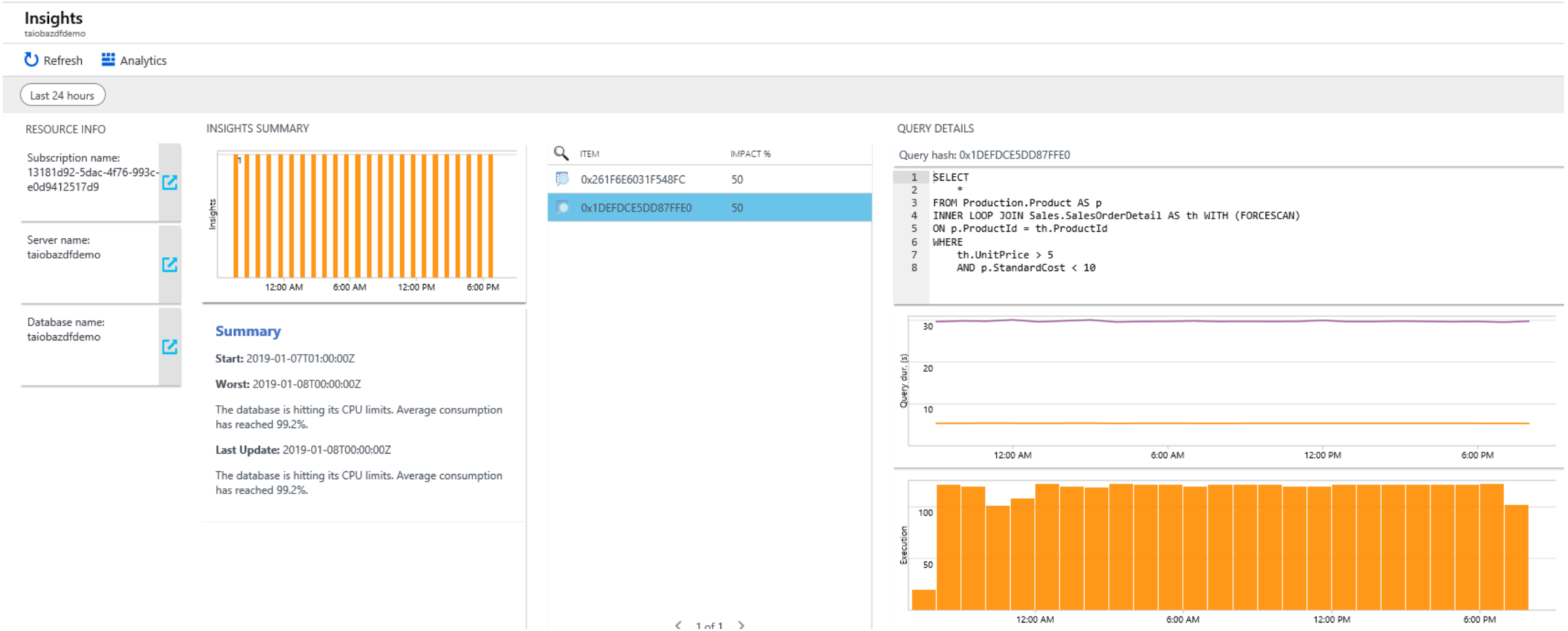


DATABASE	EXECS
taiobazdfdemo.taiobazdfdemo	372k

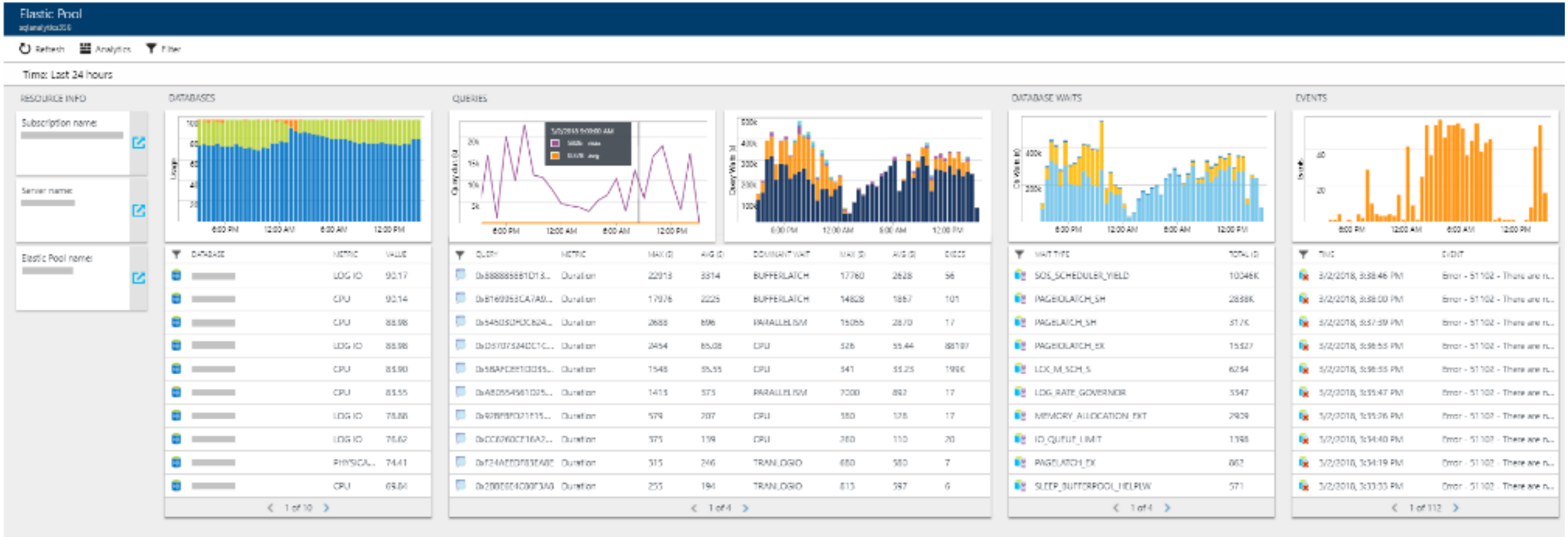
Insight Details Queries



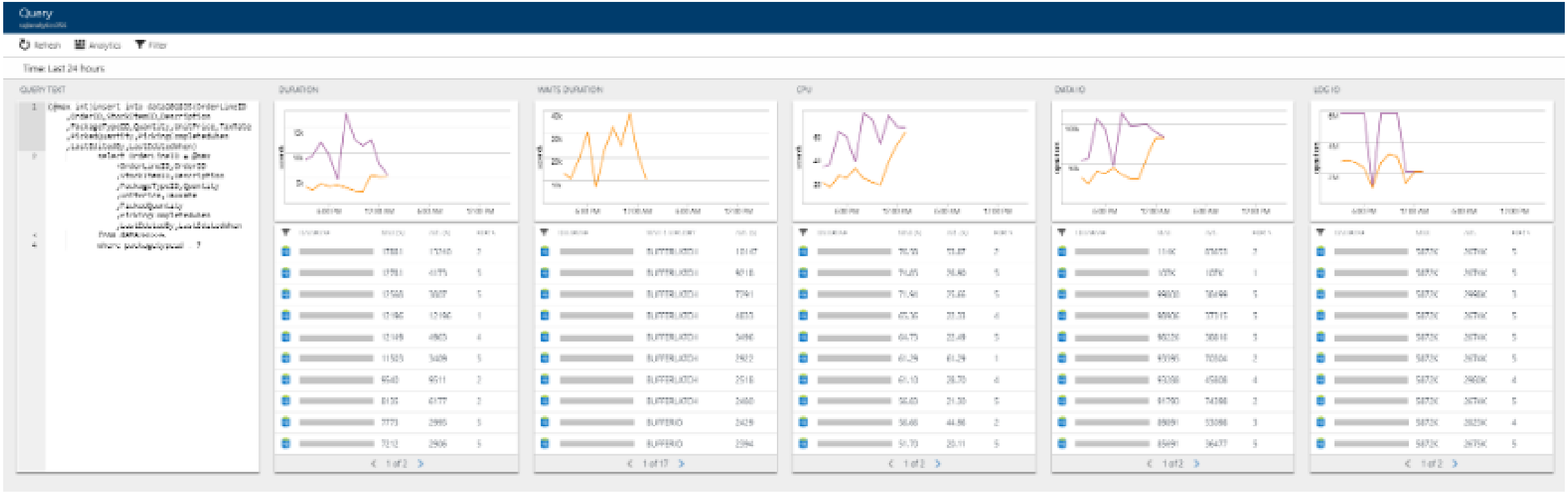
Insight Details Database Waits



High Impact Item Details



Balance Elastic Pool Resource



Single Query Performance Across

For a hands-on overview on using Azure SQL Analytics solution and for typical usage scenarios, see the embedded video

Automatic tuning

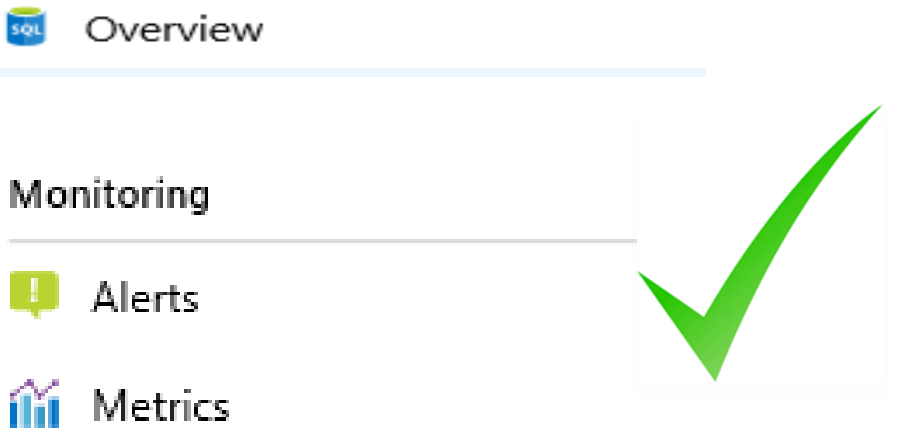
- Automatically tune some of the most common database performance issues.

Query Performance Insights

- Basic Azure SQL Database performance monitoring needs.

Azure SQL Analytics

- Advanced monitoring of database performance at scale, with built-in intelligence.



Automatic Tuning

Azure SQL Analytics

dm_db_resource_stats

- Returns cpu, IO, memory
- Collects every 15 sec
- Retains for an hour

resource_stats

- Same data rolled over every 5 minutes
- Retained for 14 days

Transaction Performance Analysis Overview

[stresstest]

SQL Server

on taiobtest at 7/8/2019 2:40:37 PM

This report helps you identify bottlenecks in your database and provide assistance to migrate them to In-Memory OLTP. The estimated migration effort is based on the SQL Server 2016 feature set. To begin, choose an option from below to see the report.

This server has been continuously operating since

Tables Analysis

Stored Procedure Analysis

SSMS Standard Report

Recommended Tables Based on Usage

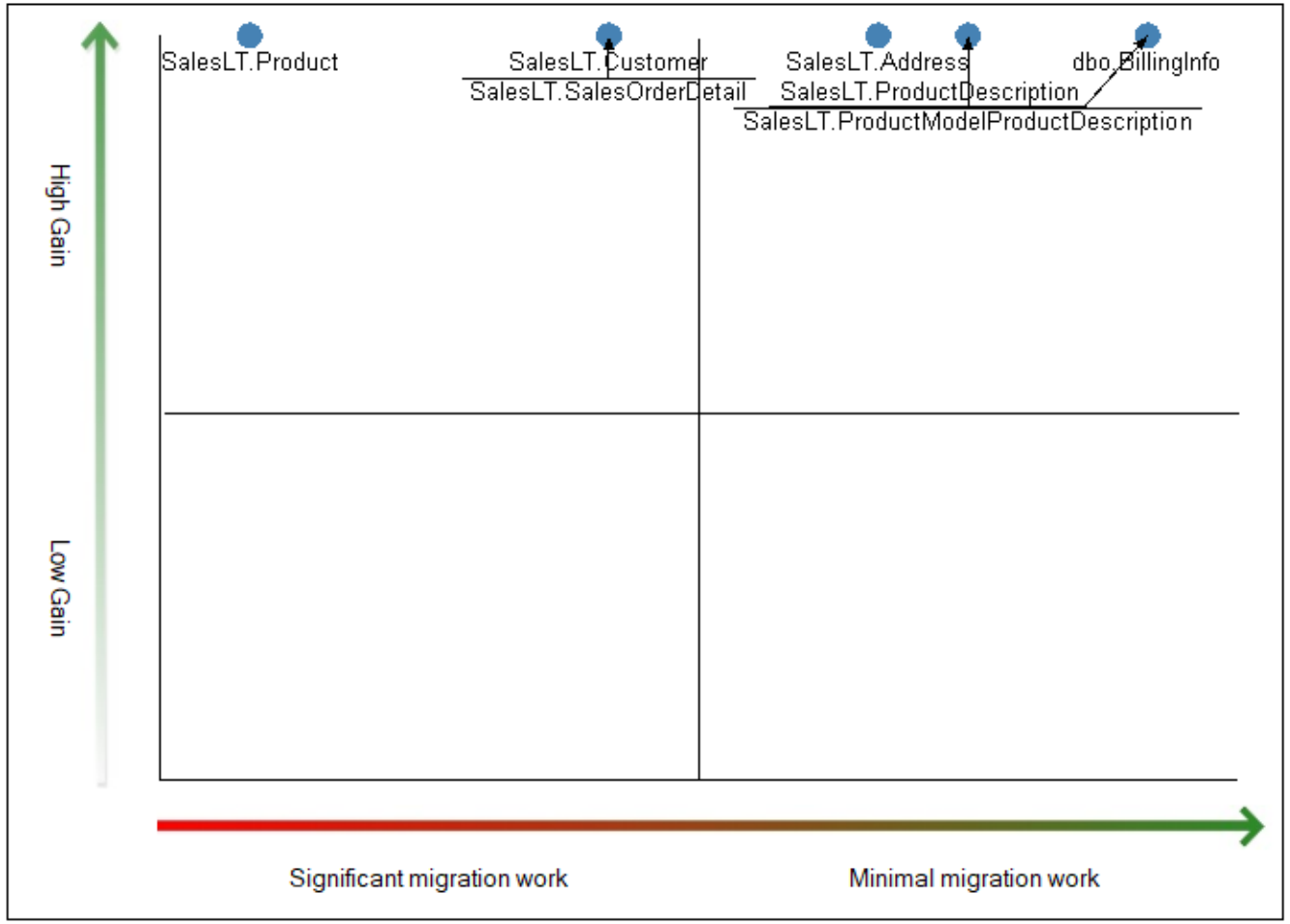
[stresstest]

on taiobtest at 7/8/2019 2:54:58 PM

SQL Server

The following chart contains the top candidate tables for memory optimization based on the access patterns of your workload. The horizontal axis represents decreasing effort of memory optimization, while the vertical axis represents increasing benefits of memory optimization in your workload. You should prioritize the tables in the top right corner of the chart for memory optimization.

Select number of Tables:
5
10
15
20
25
30



Resource

- Azure SQL Database - Monitoring and tuning
- Azure Monitor pricing
- Performance recommendations for SQL Database
- Query Performance Insight for Azure SQL Database
- Troubleshoot Azure SQL Database performance issues with Intelligent Insights
- Intelligent Insights using AI to monitor and troubleshoot database performance
- Monitor Azure SQL Database using Azure SQL Analytics (Preview)
- Use Case - Artificial Intelligence tunes Azure SQL Databases
- Log Analytics FAQ

Work

- 13 years as DBA
- MCSE Data Management and Analytics
- 10 years in Merchant Marine

Outside Work

- Running—One 26.2 and Many 13.1
- Shuttling 3 kids

Giving Back

- Co-organizer NESQL User Group
- Frequent speaker local user groups, SQL Saturdays & Virtual groups
- Answering questions at #sqlhelp & dba.stackexchange
- Blog at sqlworldwide.com

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THANK
YOU