Improving the Performance of Azure SQL Databases with Automatic Tuning

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Introduction

Exploring Automatic Tuning

- What is Automatic Tuning
- Which capabilities provides Automatic Tuning
- Azure services providing Automatic Tuning

Benefits of Automatic Tuning when compared to other Performance Tuning options

Scenarios to use Automatic Tuning

Options to enable Automatic Tuning

Enable notifications for Performance Recommendations

Exploring Automatic Tuning

What Is Automatic Tuning?

Fully managed service

Based on Artificial Intelligence and Machine Learning

Continuous performance tuning

Achieve the best performance of your SQL databases

Automatic Tuning Capabilities

Automated performance tuning

Automated verification of performance gains

Automated rollback and self-correction

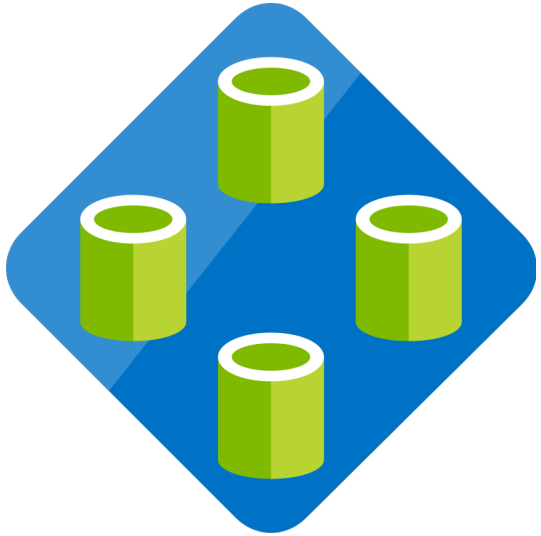
Tuning history

Proactive workload performance monitoring

Adapts to workload changes

Which Azure SQL Services Provide Automatic Tuning?

Azure SQL Single Database

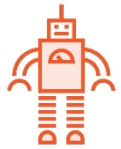


Azure SQL Pooled Database

Azure Managed Instance Database

Benefits of Using Automatic Tuning When Compared to Other Performance Tuning Options

Benefits of Automatic Tuning



Automated database performance tuning

Continuous database performance monitoring

Fully managed service built by Microsoft engineers

No required database administration expertise

Saves time and effort and no additional cost

Scenarios to Use Automatic Tuning

When we or our team have no database administration expertise

Large number of databases to manage or limited team size

Save time and money

Options to Enable Automatic Tuning

Options to Enable Automatic Tuning

Server	Database
Azure Portal	Azure Portal
REST API (GET, UPDATE methods)	REST API
	T-SQL

May be disabled by the system

Requires one of the following RBAC roles: SQL DB Contributor, SQL Server Contributor, Contributor or Owner.

Manage Automatic Tuning Using T-SQL

View current Automatic Tuning configuration

- `SELECT * FROM sys.database_automatic_tuning_options`

View tuning recommendations and history

- `SELECT * FROM sys.dm_db_tuning_recommendations`

Enable Automatic Tuning

- `ALTER DATABASE current SET AUTOMATIC_TUNING = AUTO`
  (possible values AUTO, INHERIT and CUSTOM)

Manage Automatic Tuning Using T-SQL

Configure Automatic Tuning options

```
- ALTER DATABASE current SET AUTOMATIC_TUNING (
  FORCE_LAST_GOOD_PLAN = [ON | OFF | DEFAULT], CREATE_INDEX =
  [ON | OFF | DEFAULT], DROP_INDEX = [ON | OFF | DEFAULT]))
```

Enable Notifications for Performance Recommendations

Steps To Build Your Notifications System

1st

Retrieve Performance Recommendations using REST API (or even Powershell)

GET https://management.azure.com/subscriptions/{subscriptionId}/resourceGroups/{resourceGroupName}/providers/Microsoft.Sql/servers/{serverName}/databases/{databaseName}/advisors/{advisorName}/recommendedActions?api-version=2015-05-01-preview

2nd

Parse and filter results

3rd

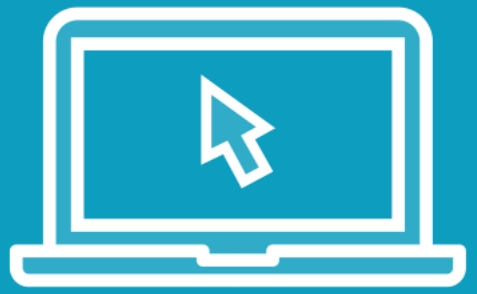
Send email with filtered results

Using REST API + Logic App

or

Automation Account + Powershell script + Microsoft Flow

Demo



Enable Automatic Tuning on Database Server

Enable Automatic Tuning on Database

Configure the Automatic Tuning options

Summary

- What is Automatic Tuning and what capabilities it provides
- What are the benefits of using Automatic Tuning
- Which scenarios are recommended to use Automatic Tuning
- What are the options available to enable Automatic Tuning
- How to enable notifications for Performance Recommendations