itm8 Databasens dag

Microsoft SQL Server Performance
Steen Cornelius

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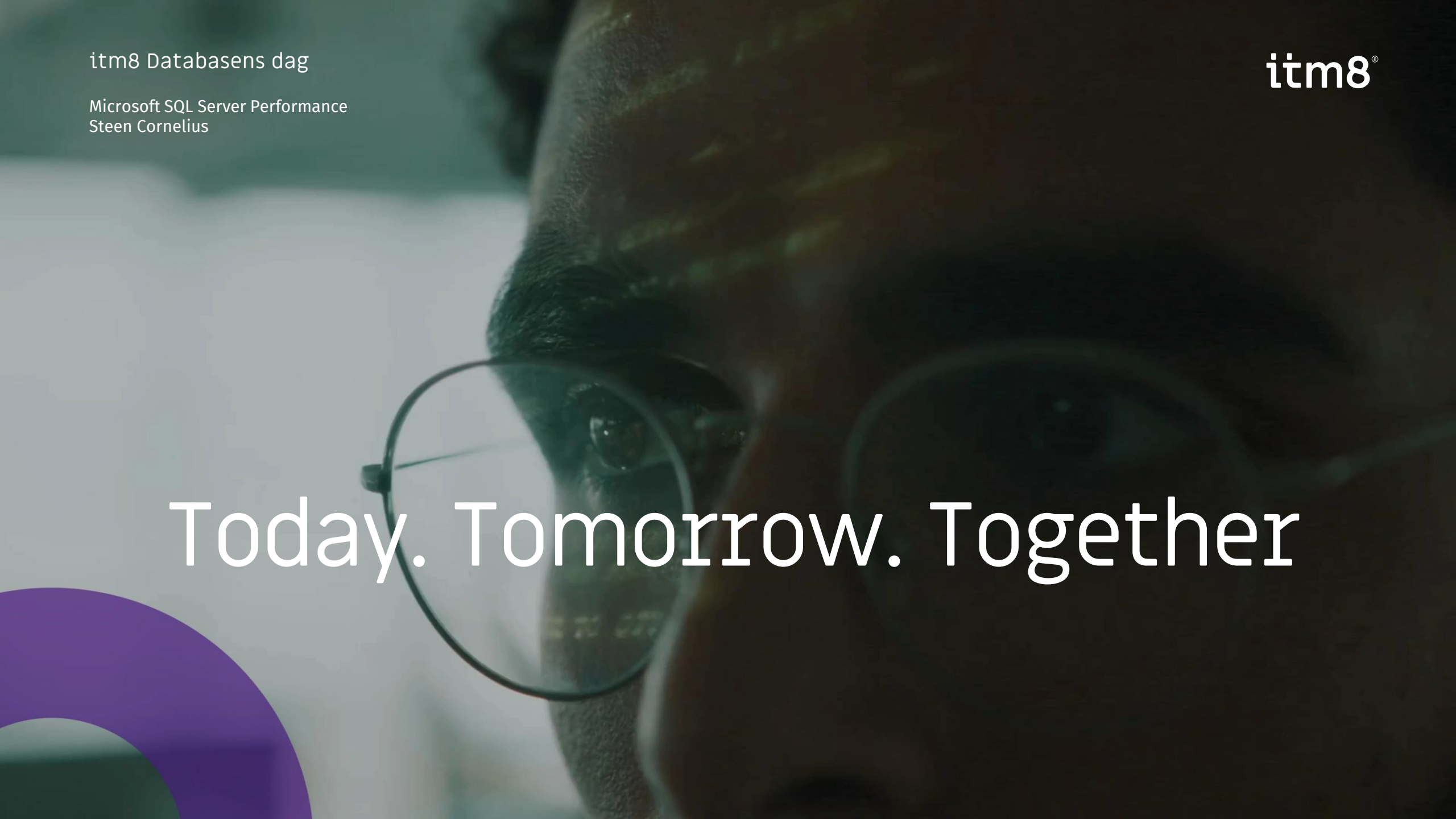

AGENDA
SQL SERVER PERFORMANCE

01. SQL Server version

02. Setup

03. Configure

04. Databases

05. Query Store

06. Tables and Indexes

07. Maintenance

08. Queries

09.

10.

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SQL Server version (Onprem)

- SQL Server 2022, SQL Server 2019 or SQL Server 2017
- SQL Server 2016, SQL Server 2014, SQL Server 2012 or SQL Server 2008 R2

https://sqlserverbuilds.blogspot.com

Setup

Hardware settings

4x Disk Controllers

CPU clockfrequency vs number of cores

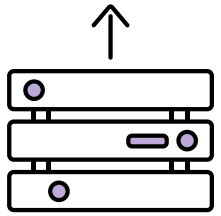
https://opvizor.com/blog/deep-dive-into-performance-of-vmware-scsi-controller-and-nvme-controller

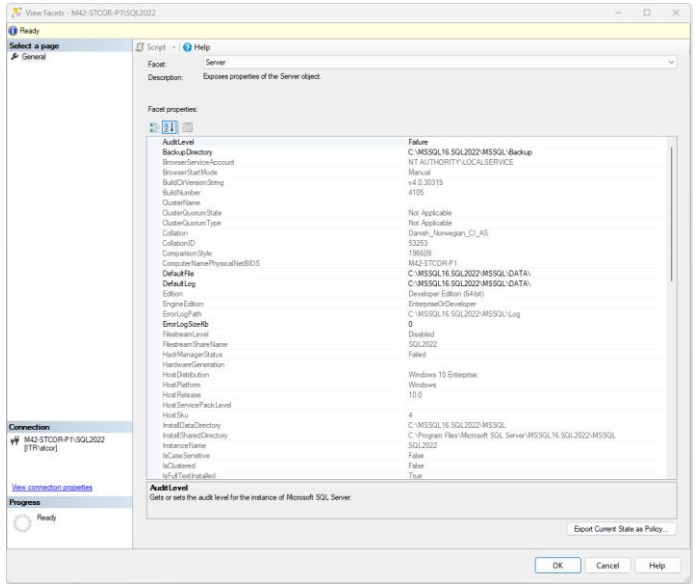
Setup

Software settings

Traceflags/Startup parameters
Local Security Policy

https://learn.microsoft.com/en-us/sql/t-sql/database-console-commands/dbcc-traceon-trace-flags-transact-sql?view=sql-server-ver16





Configure

SQL Server Management Studio (SSMS)

sp_configure

Facets

Databases

Database Scoped Configuration
N+1 datafiles
VLFs

N+1 datafiles

```
-- 4 cores --> 4+1 datafiles
-- Up to 8+1 datafiles
CREATE DATABASE [MultiFiles]
 CONTAINMENT = NONE
 ON  PRIMARY
( NAME = N'MultiFiles', FILENAME = N'E:\MSSQL15.SQL2019\MSSQL\DATA\MultiFiles.mdf' , SIZE = 128MB , FILEGROWTH = 128MB ),
 FILEGROUP [DATA]
( NAME = N'MultiFiles_data1', FILENAME = N'F:\MSSQL15.SQL2019\MSSQL\DATA\MultiFiles_data1.ndf' , SIZE = 1GB , FILEGROWTH = 1GB ),
( NAME = N'MultiFiles_data2', FILENAME = N'G:\MSSQL15.SQL2019\MSSQL\DATA\MultiFiles_data2.ndf' , SIZE = 1GB , FILEGROWTH = 1GB ),
( NAME = N'MultiFiles_data3', FILENAME = N'H:\MSSQL15.SQL2019\MSSQL\DATA\MultiFiles_data3.ndf' , SIZE = 1GB , FILEGROWTH = 1GB ),
( NAME = N'MultiFiles_data4', FILENAME = N'I:\MSSQL15.SQL2019\MSSQL\DATA\MultiFiles_data4.ndf' , SIZE = 1GB , FILEGROWTH = 1GB )
 LOG ON
( NAME = N'MultiFiles_log', FILENAME = N'L:\MSSQL15.SQL2019\MSSQL\DATA\MultiFiles_log.ldf' , SIZE = 1GB , FILEGROWTH = 1GB )
GO

USE [MultiFiles]
GO
ALTER DATABASE SCOPED CONFIGURATION SET MAXDOP = 2;
GO
ALTER DATABASE SCOPED CONFIGURATION SET PARAMETER_SNIFFING = On;
GO
ALTER DATABASE SCOPED CONFIGURATION SET QUERY_OPTIMIZER_HOTFIXES = On;
GO

IF NOT EXISTS
(SELECT name FROM sys.filegroups WHERE is_default=1 AND name = N'DATA') ALTER DATABASE [MultiFiles] MODIFY FILEGROUP [DATA] DEFAULT
GO
```

Query Store

Turn it on

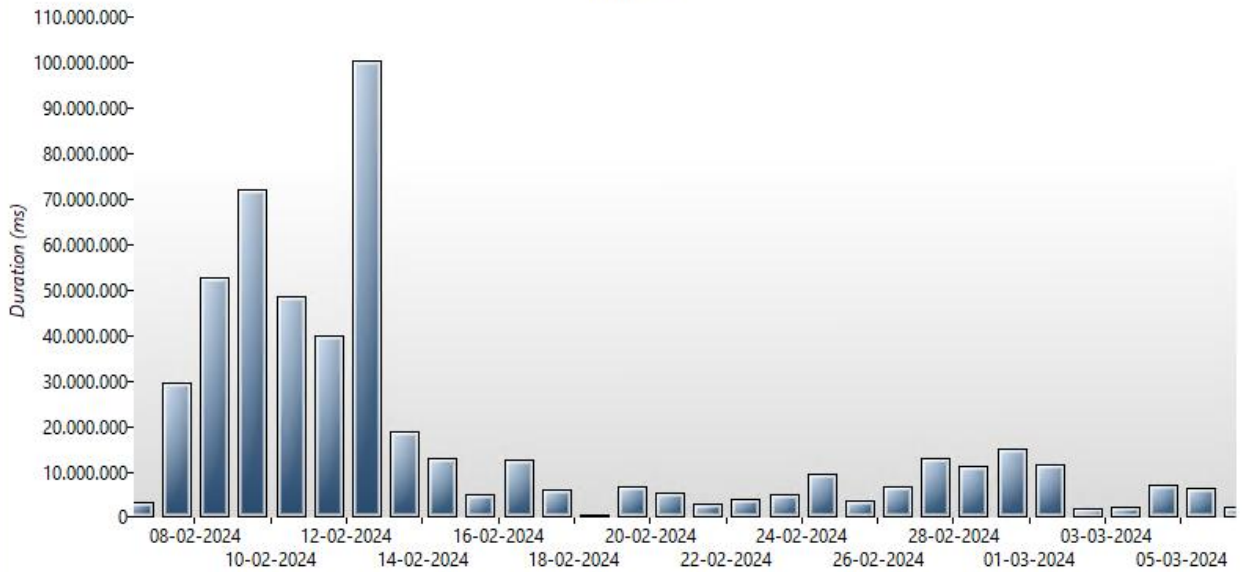
https://learn.microsoft.com/en-us/sql/relational-databases/performance/monitoring-performance-by-using-the-query-store?view=sql-server-ver16

Overall Resource C...ption [BookingRepl] | Object Explorer Details

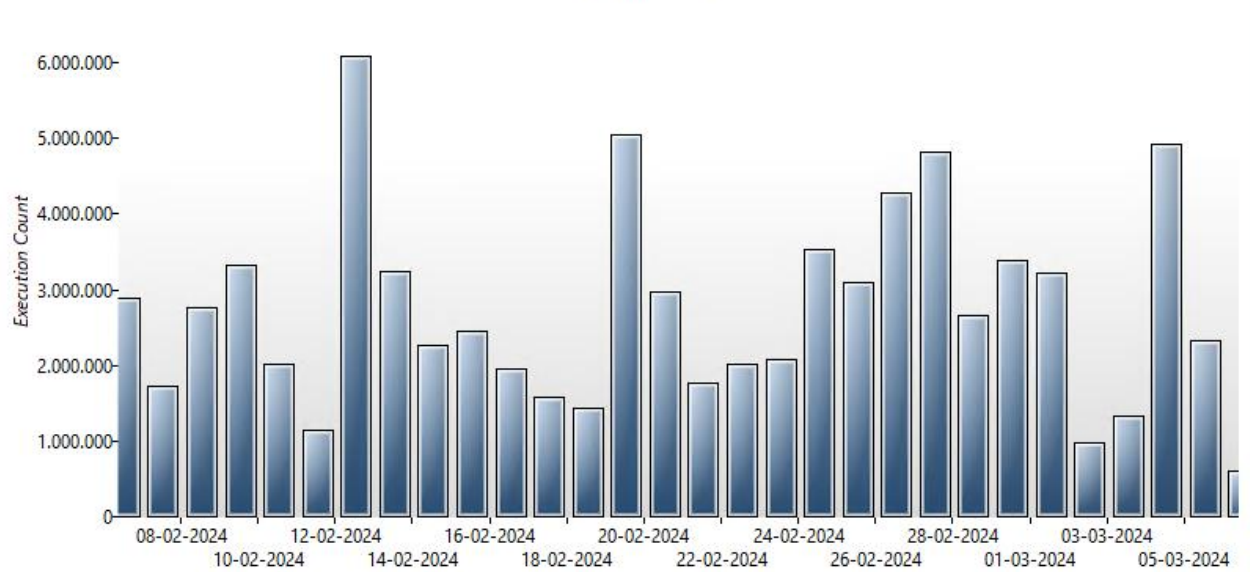
Overall resources consumption for database BookingRepl. Time period: Last month ending at 06-03-2024 09:22

Configure | Refresh | Standard Grid | Chart

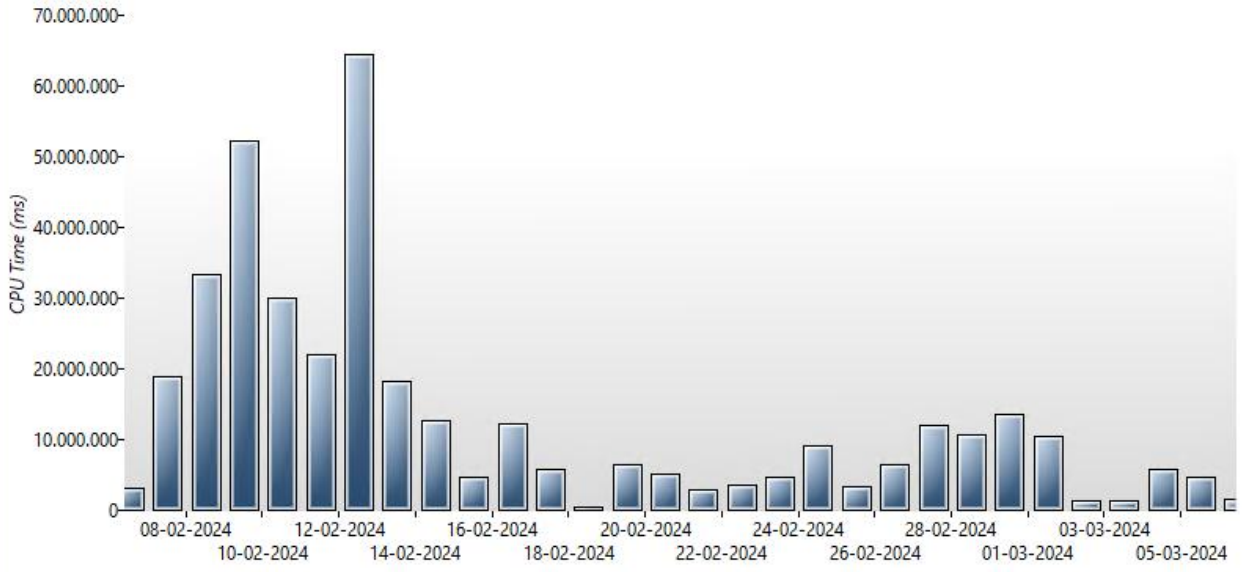
Duration



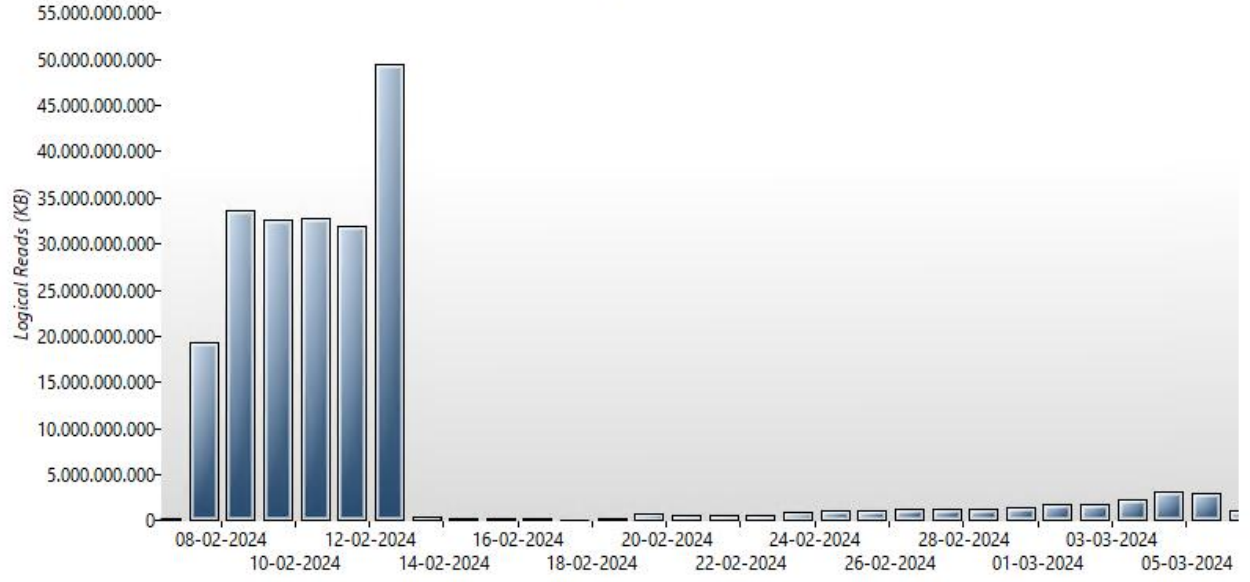
Execution Count



CPU Time



Logical Reads



Tables and Indexes

Tables

Compression
Memory Optimized

https://learn.microsoft.com/en-us/sql/relational-databases/in-memory-oltp/introduction-to-memory-optimized-tables?view=sql-server-ver16
https://learn.microsoft.com/en-us/sql/relational-databases/in-memory-oltp/creating-a-memory-optimized-table-and-a-natively-compiled-stored-procedure?view=sql-server-ver16&source=recommendations

Tables and Indexes

Indexes

Missing indexes
Columnstore Indexes

Maintenance

Statistics
Proper indexes
Executionplans are based it

https://ola.hallengren.com
https://www.brentozar.com/first-aid

Queries

CTE vs Temp tables
Implicit CONVERT

https://learn.microsoft.com/en-us/sql/t-sql/queries/with-common-table-expression-transact-sql?view=sql-server-ver16

CTE vs Temp tables

```
-- Create a Temp table
SELECT * INTO #TempCustomer FROM Sales.Customer:

SELECT * FROM #TempCustomer;

-- Create a CTE
WITH CTE_Customer (CustID, PersID, Store_ID, TerID, Account, row, Date) AS
(SELECT CustomerID, PersonID, StoreID, TerritoryID, AccountNumber, rowguid, ModifiedDate
FROM Sales.Customer)
SELECT * FROM CTE_Customer;

-- Gone
SELECT * FROM CTE_Customer;
```

Let’s build today’s and tomorrow’s IT. Together?

Thank you for your attention

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