



Azure SQL Databases, tales from the trenches

Data Saturday Gothenborg



Data Saturday Gothenburg 2022

Sponsors



The after-party sponsor



Quest®

Pagesplit
Solutions





Database

Trenches

Setup





The old way

SQL Server

Choosing your own hardware
Standard or Enterprise Edition
Configuration

Azure SQL

The new way

Cloud service, Managed Instance or on a VM

What Tier to choose

What SKU to choose

Network connectivity challenges

No more SA!

Migration is... different



Where to look

Where to start
What to look out for



Opinions



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SQL: DBA, Performance tuning

Azure: architect, developer, admin

SQL Classes

Public speaker

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On premises

SQL Server

Choosing your own hardware
Standard or Enterprise Edition
Configuration

Azure SQL

Let's cloud!

Cloud service, Managed Instance or on a VM
What Tier to choose
What SKU to choose
Network connectivity challenges
No more SA!
Migration is... different



- ▶ Datawarehousing
- ▶ From on-premises to Azure
- ▶ New database

| QUESTIONS

- ▶ Lift and shift or migrate?
- ▶ What Tier should I choose?
- ▶ Within the Tier, what SKU?
- ▶ Can I change between Tiers?
- ▶ Do I need to think about other things?

- ▶ VM if you want to transfer your workload to the cloud without any changes
- ▶ MI if you want to transfer your workload to the cloud but want to take some advantages of cloud offerings
- ▶ PaaS if you want all the cloud goodies with the least management overhead

- ▶ Basic
- ▶ Standard
- ▶ Premium
- ▶ General Purpose (serverless or provisioned)
- ▶ Hyperscale
- ▶ Business Critical

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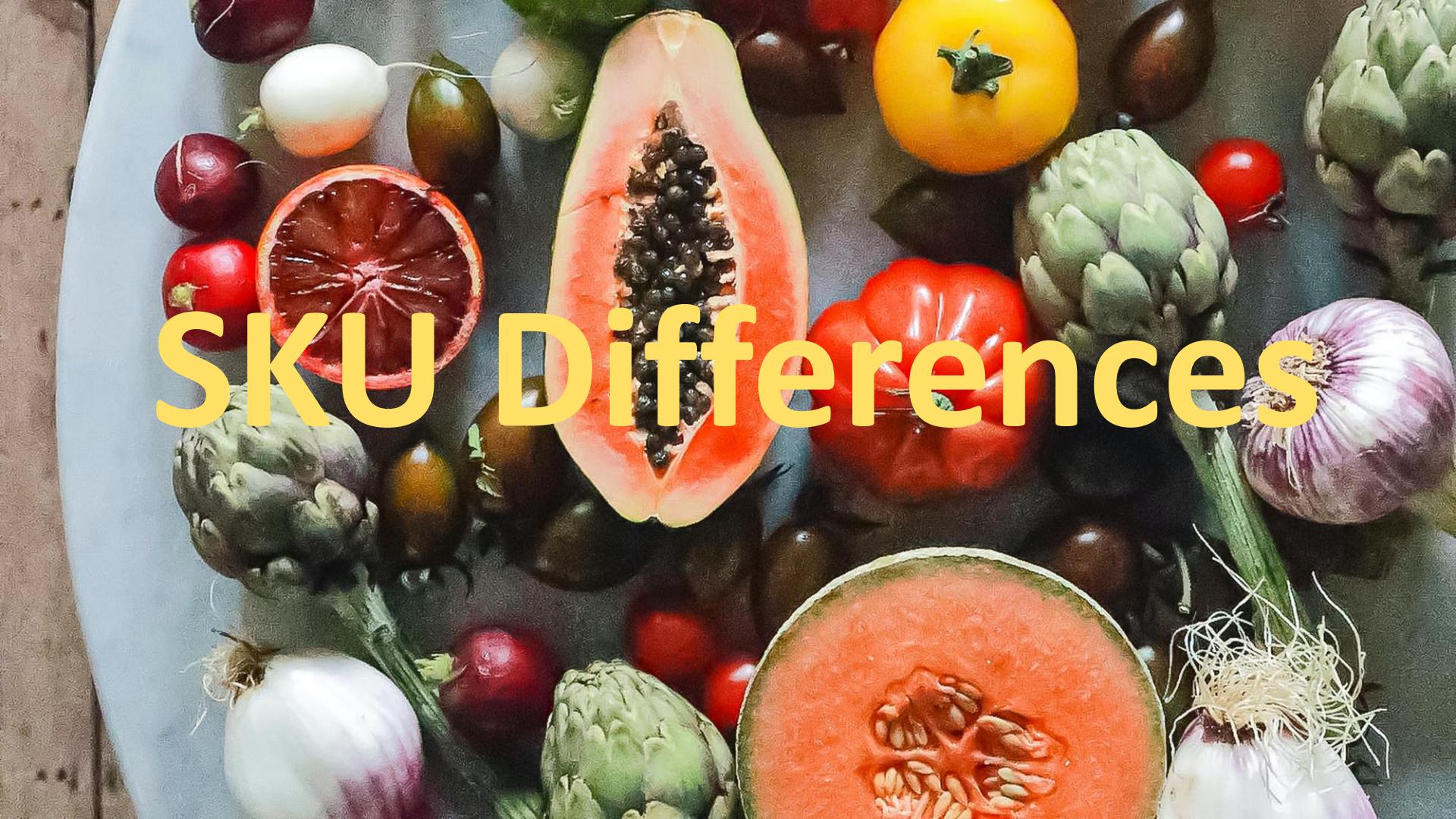
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Full Recovery Model!!

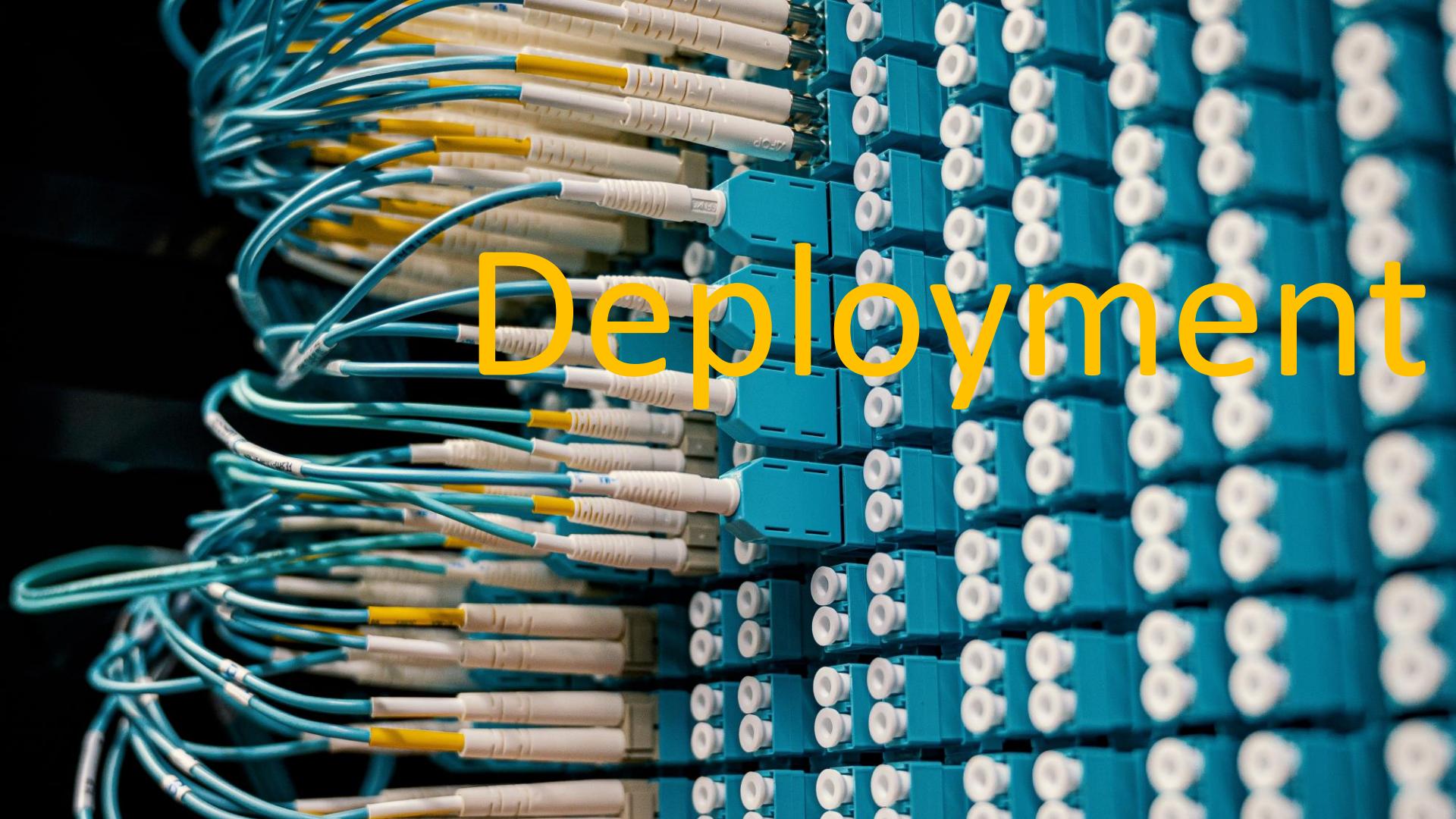
SKU Differences



- ▶ DTU's
- ▶ Cores
- ▶ Minimum number of cores
- ▶ Database sizing
- ▶ TempDB files
- ▶ Storage
- ▶ IOPS
- ▶ Log Rate
- ▶ Replication
- ▶ Backups

- ▶ Blend of CPU, Memory, reads and writes
- ▶ Calculator: <https://dtucalculator.azurewebsites.net/>
 - Total % Processor Time
 - Total disk reads per second
 - Total disk writes per second
 - Total log bytes flushed per second

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A close-up photograph of a network rack. The rack is filled with a dense arrangement of blue and yellow fiber optic cables. These cables are terminated at a series of blue modular ports, which are mounted in a dark-colored panel. The ports have multiple white circular ports for connecting individual fibers. The word "Deployment" is overlaid in large, bold, yellow font across the center of the image.

Deployment

- ▶ Connectivity
- ▶ Public or Private Endpoint
- ▶ Network and Firewall
- ▶ Duration

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Feedback

Public access Private access **Connectivity**

Outbound networking

Restrict network access to a specific set of resources by supplying their fully-qualified domain names. [Learn more](#)

Restrict outbound networking

Restrictions disabled.

[Configure outbound networking restrictions](#)

Connection Policy

Configure how clients communicate with your SQL database server. [Learn more](#)

Connection policy

- Default - Uses Redirect policy for all client connections originating inside of Azure and Proxy for all client connections originating outside Azure
- Proxy - All connections are proxied via the Azure SQL Database gateways
- Redirect - Clients establish connections directly to the node hosting the database

Encryption in transit

This server supports encrypted connections using Transport Layer Connections (TLS). Any login attempts from clients using a TLS version less than the Minimum TLS Version shall be rejected. For [more](#)

Minimum TLS version

TLS 1.0

- ▶ Connectivity
- ▶ Public or Private Endpoint
- ▶ Network and Firewall
- ▶ Duration

Security



- ▶ Azure AD Administratorsgroup
- ▶ Azure AD Usergroup(s)
- ▶ SQL Accounts

Where to look

Where to start
What to look out for



- ▶ On-premises twice as fast
- ▶ Analyse disk performance, wait stats and use Query Store
- ▶ Change tier and SKU
- ▶ Change ETL process
- ▶ Azure 10% quicker than on-premises
- ▶ Writes slow you down!

- ▶ Read the documentation
- ▶ Create a script
- ▶ Run it for baseline
- ▶ Run it against the Azure offerings
- ▶ Read the documentation

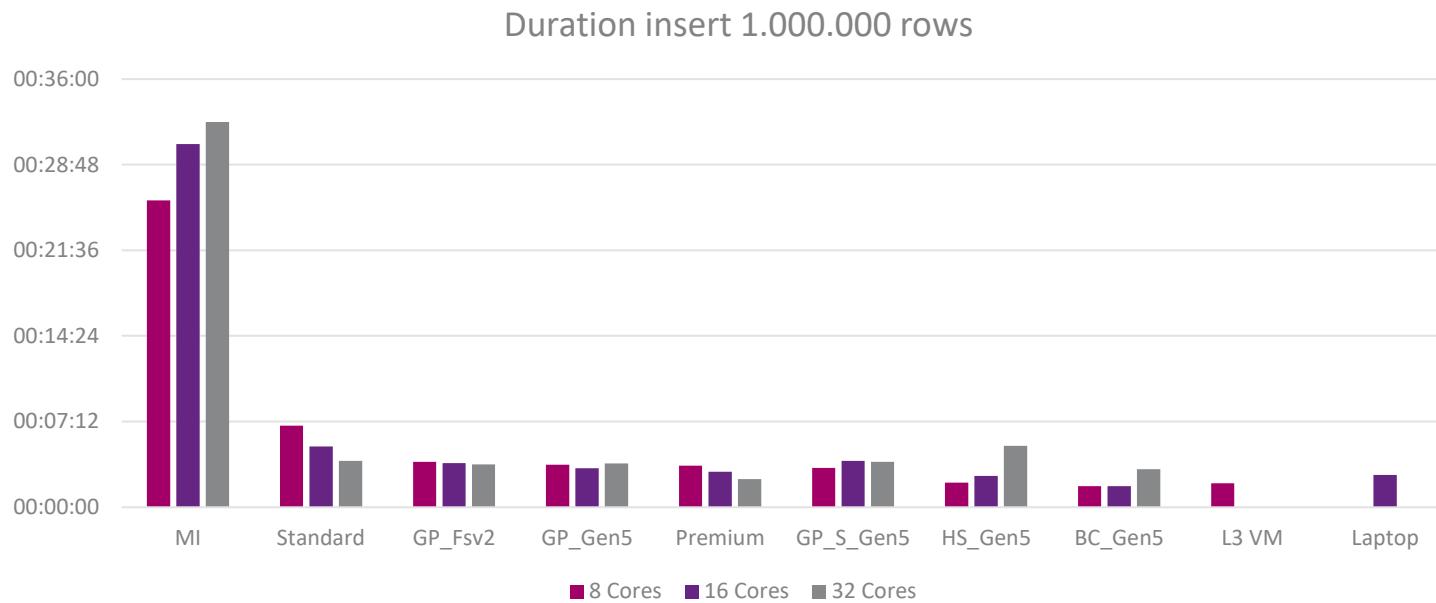
- ▶ Hardware check
- ▶ Insert
- ▶ Select
- ▶ Delete
- ▶ Update
- ▶ SqlStress to (over)load the database

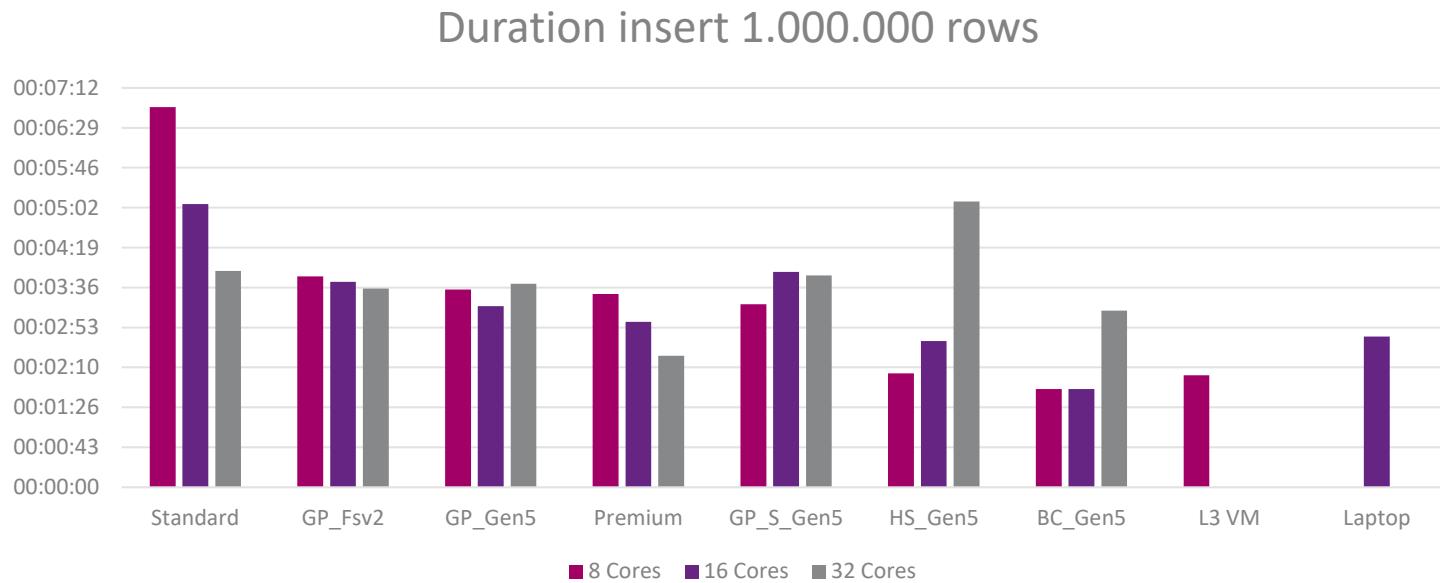


| RESULTS!

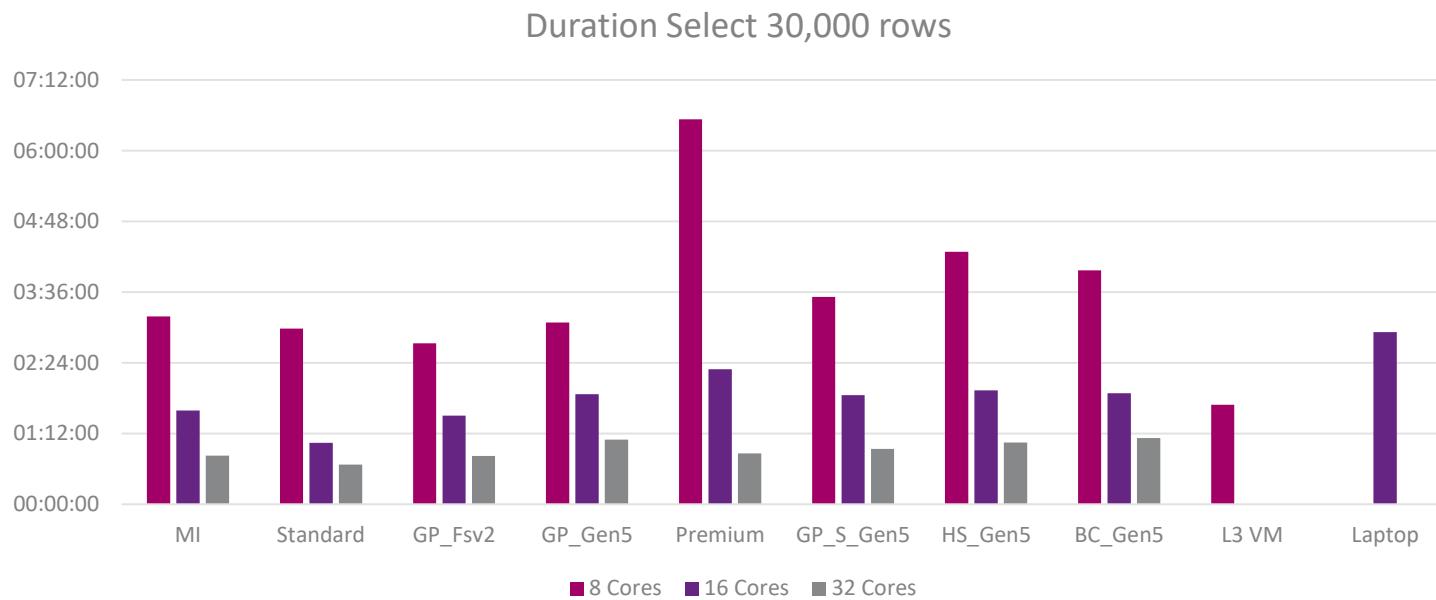
- ▶ 8, 16 and 32 core environments
- ▶ Per query graphs

INSERT PERFORMANCE

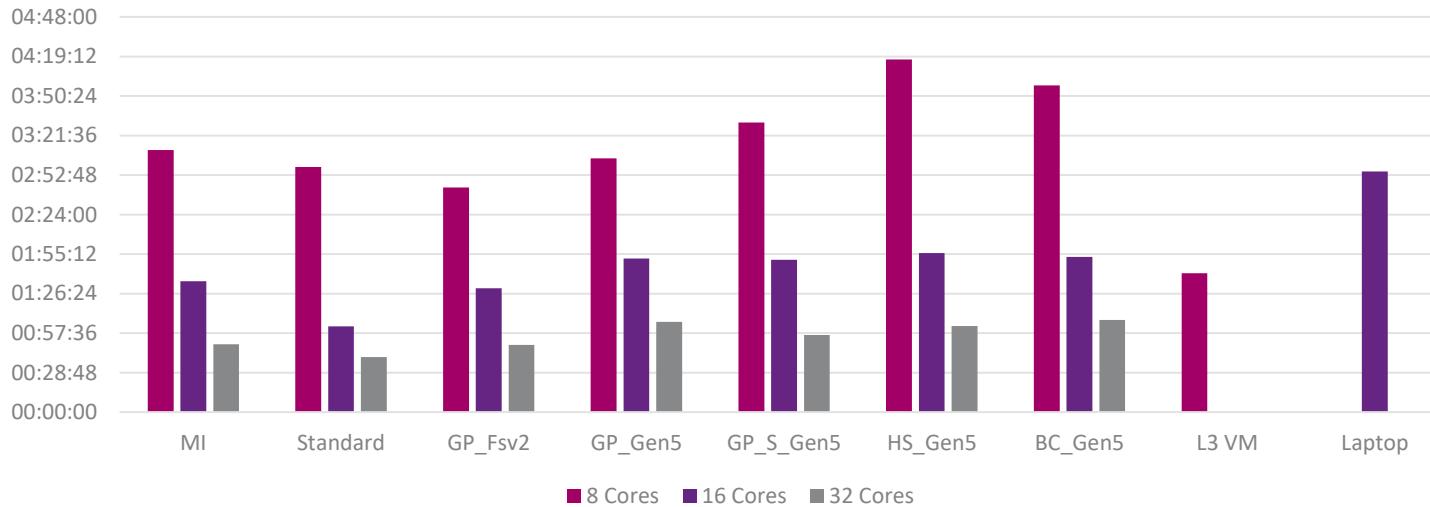




SELECT PERFORMANCE

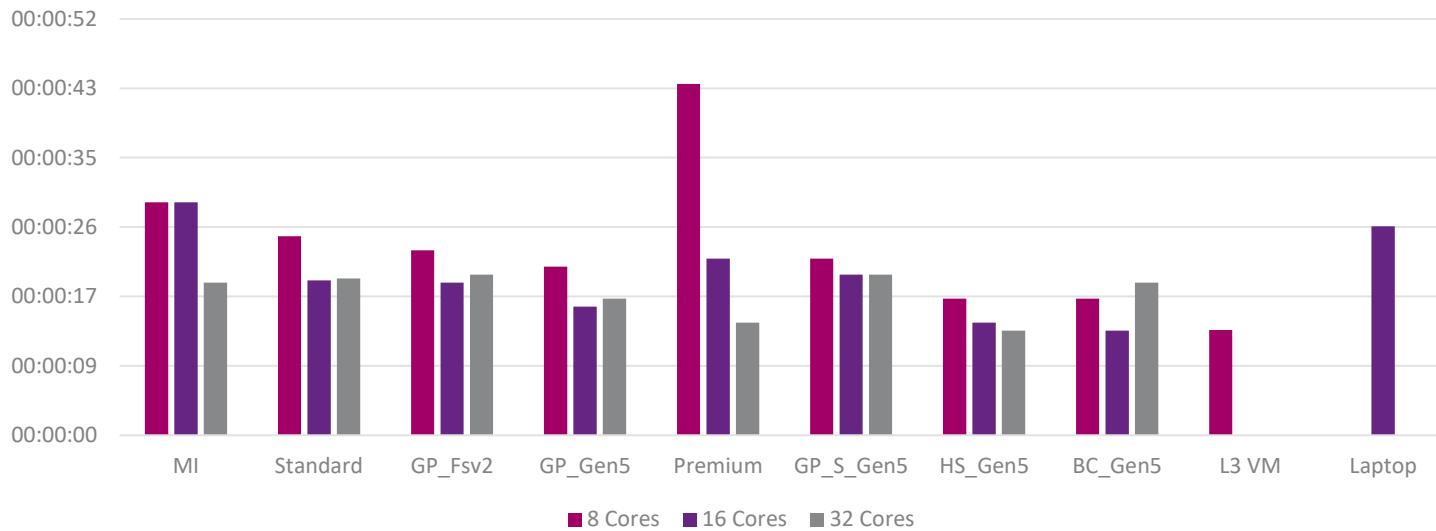


Duration Select 30,000 rows

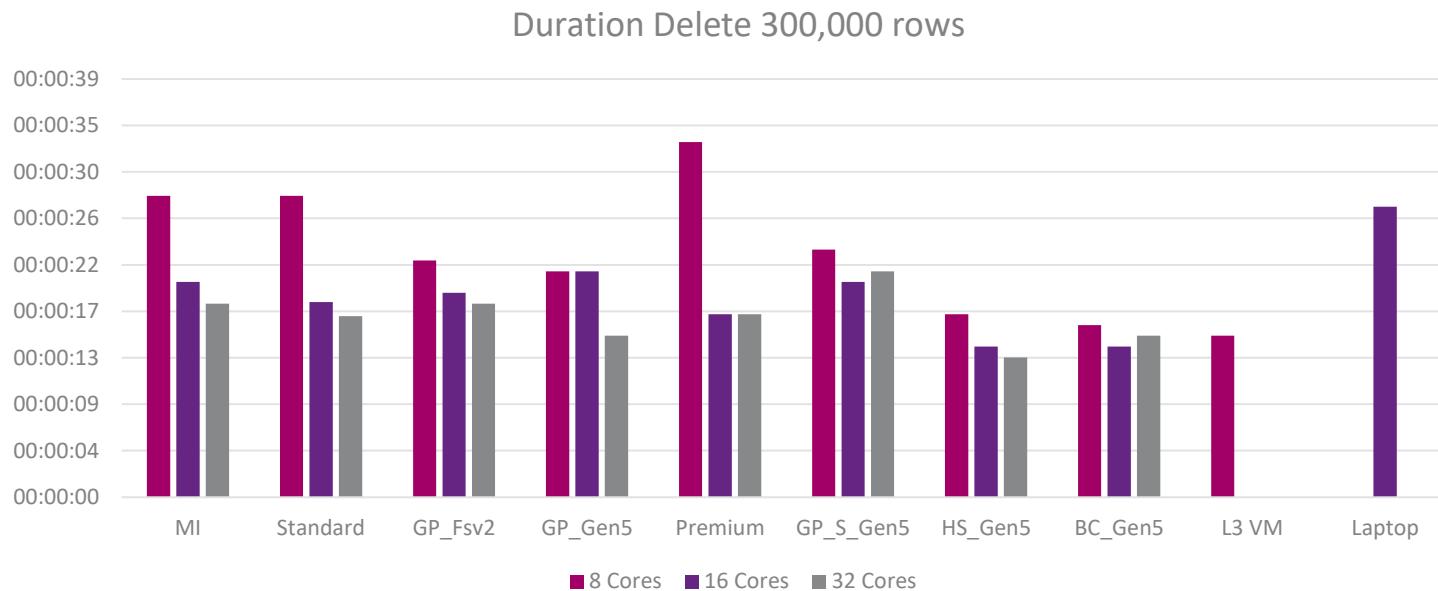


UPDATE PERFORMANCE

Duration Update 300,000 rows



DELETE PERFORMANCE





| WAIT STATS

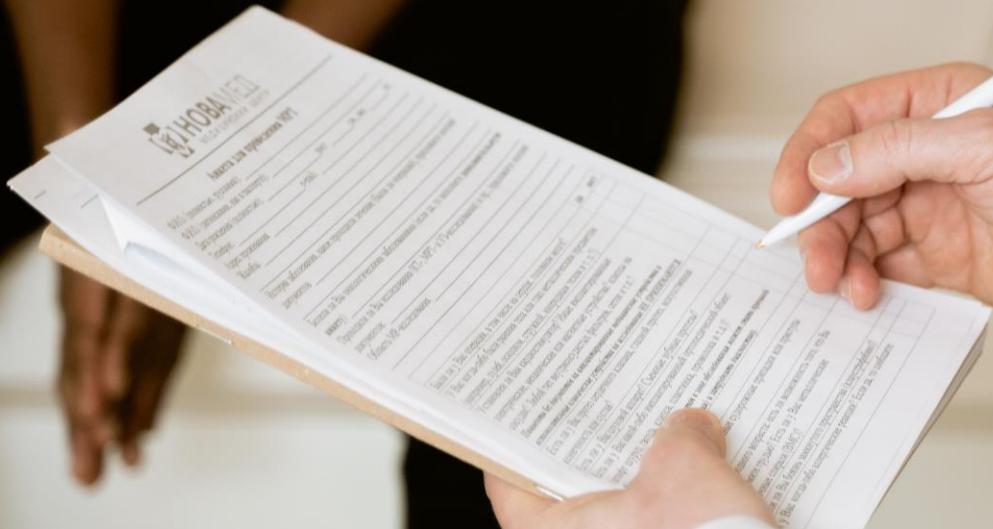
- ▶ Write log
- ▶ Resource Governor
- ▶ IO Queue limit
- ▶ Sos Scheduler Yield
- ▶ Backup IO
- ▶ Page Latch
- ▶ Latch
- ▶ CXPacket
- ▶ Hadr fabric callback

| LIMITATIONS

- ▶ <https://docs.microsoft.com/en-us/azure/azure-sql/database/resource-limits-vcore-single-databases?view=azuresql>

- ▶ <https://docs.microsoft.com/en-us/azure/azure-sql/database/resource-limits-dtu-single-databases?view=azuresql>

Concluding



MAIN POINTS

- ▶ If you have intermittent workloads, start with standard or serverless
- ▶ If you have a continuous workload, or at least more than 25% of the time, go provisioned
- ▶ If you need speed, go hyperscale or business critical
- ▶ If you need large databases (over 40 TB), go hyperscale
- ▶ If you have legacy stuff, go either managed instance or use a VM.

A side-on collision between a red car and a yellow car. The red car's front end is crushed, and glass shards are flying through the air. The yellow car's front right corner is impacted. In the background, a banner reads "AXA crashtests".

TEST

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<https://www.linkedin.com/in/reitseeskens/>

<https://github.com/reitse/Speaking>

@2meterDBA

Thank you!