Microsoft

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Help, I need to migrate my On Premise Database to Azure, which Database Tier do I have to choose from

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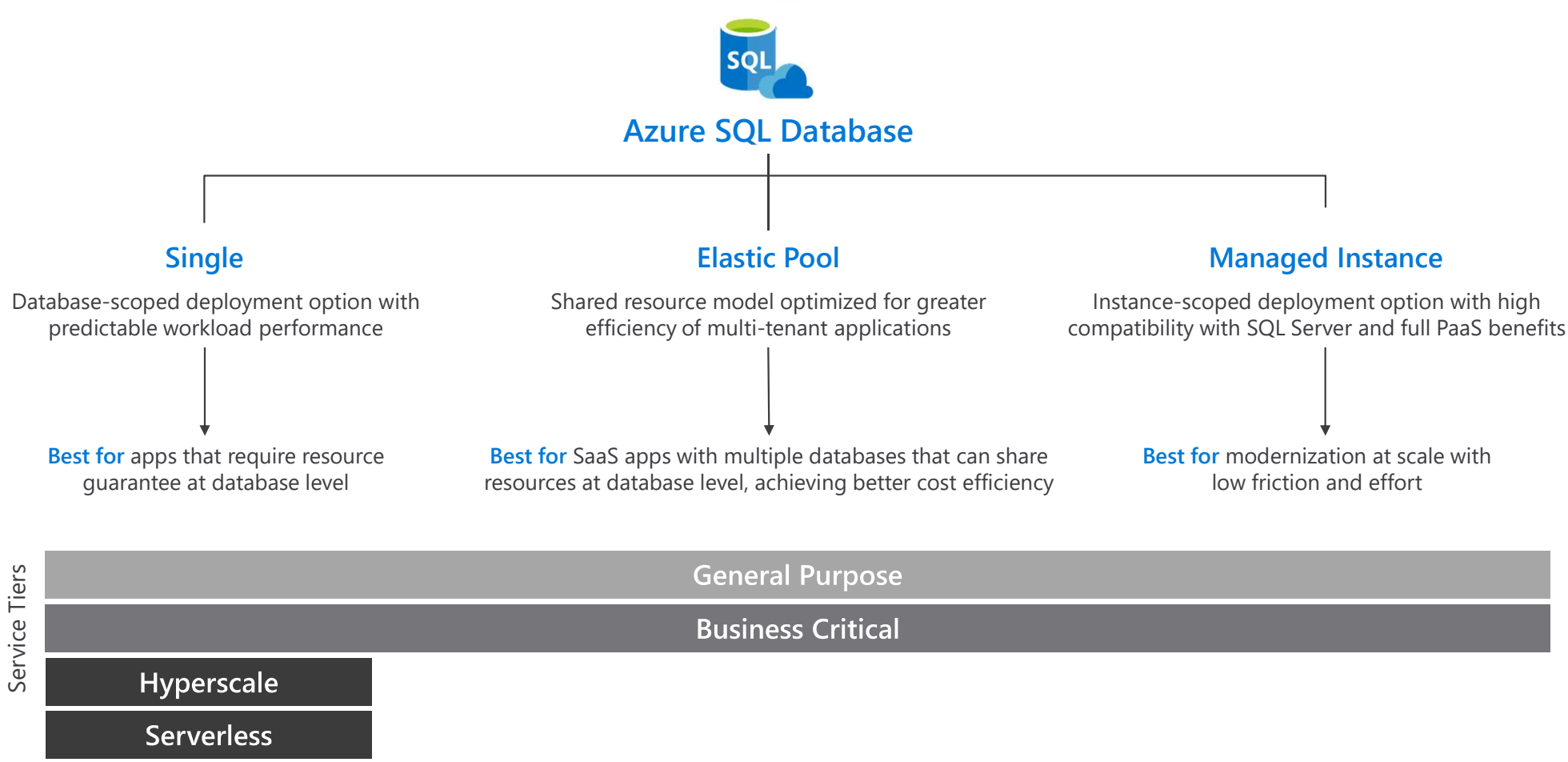
VIQTOR DAVIS
DATA CRAFTSMANSHIP

AGENDA

- Azure SQL deployment options
- Data Migration Assistant
- Data Migration Service
- Questions

Azure SQL Database
The developer's intelligent cloud database service

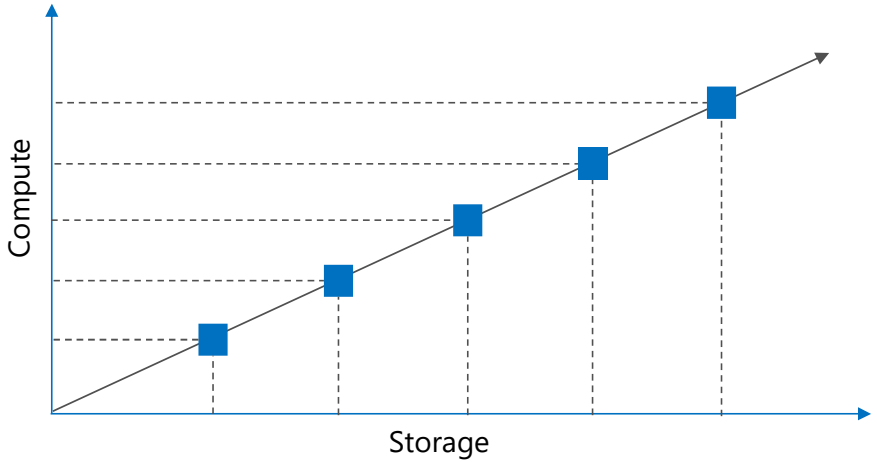
Azure SQL Database deployment option



Flexible compute & storage options

DTU model

Simple, preconfigured



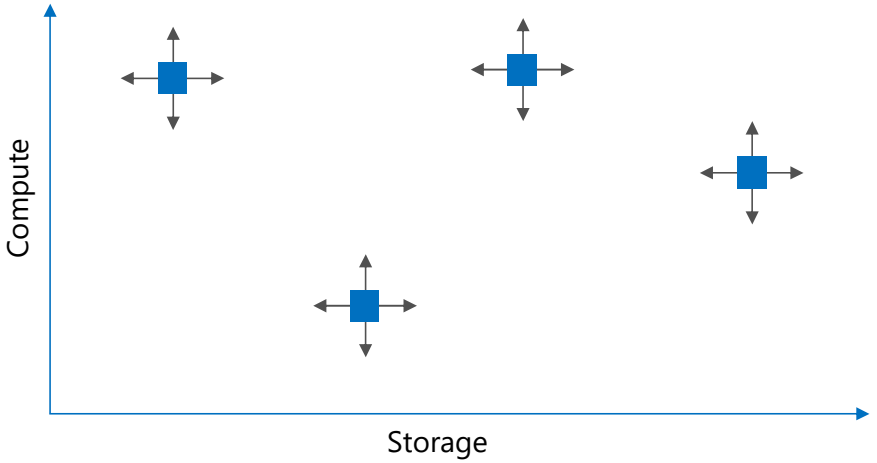
Pre-packaged, bundled unit that represents the database power

Designed for predictable performance, but somewhat inflexible and limited in options

DTU sizing offers simplicity of choice

vCore model

Independent scalability

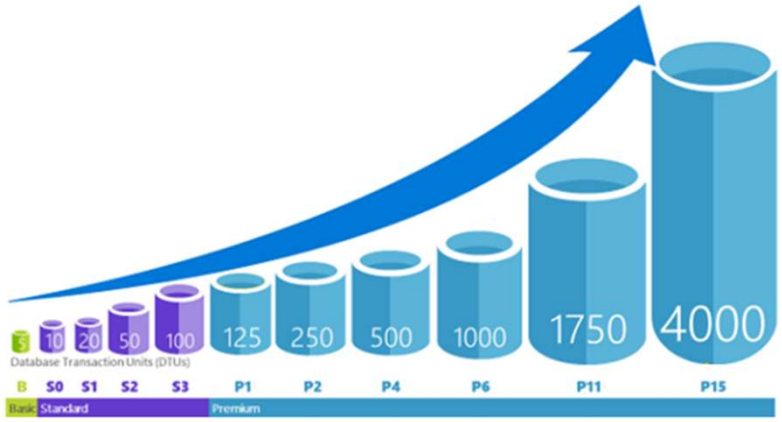


This model allows you to independently choose compute and storage resources. It also allows you to use Azure Hybrid Benefit for SQL Server to gain cost savings.

Best for customers who value flexibility; control and transparency

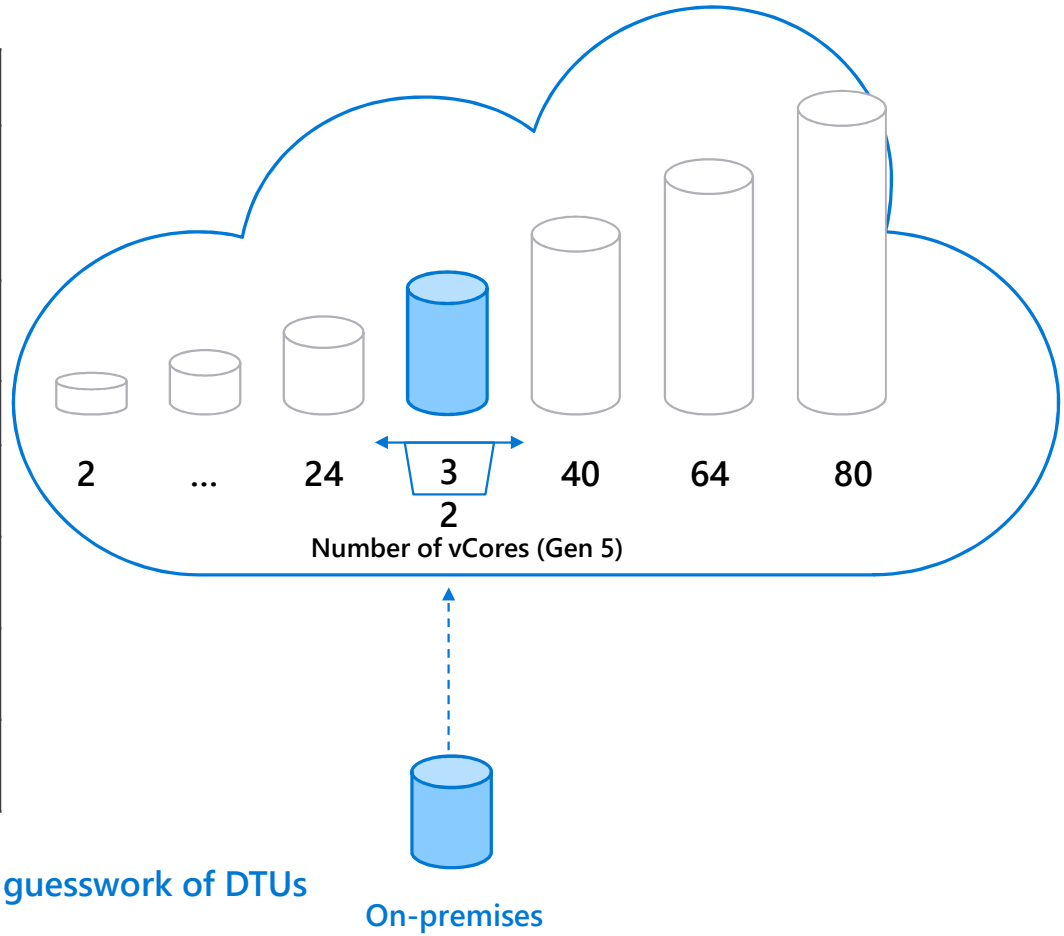
Azure SQL DB DTU Model

	Basic	Standard	Premium
Target workload	Development and production	Development and production	Development and production
Uptime SLA	99.99%	99.99%	99.99%
Backup retention	7 days	35 days	35 days
CPU	Low	Low, Medium, High	Medium, High
IO throughput (approximate)	2.5 IOPs per DTU	2.5 IOPs per DTU	48 IOPs per DTU
IO latency (approximate)	5 ms (read), 10 ms (write)	5 ms (read), 10 ms (write)	2 ms(read/write)
Columnstore indexing	N/A	S3 and above	Supported
In-memory OLTP	N/A	N/A	Supported



Azure SQL DB vCores Model

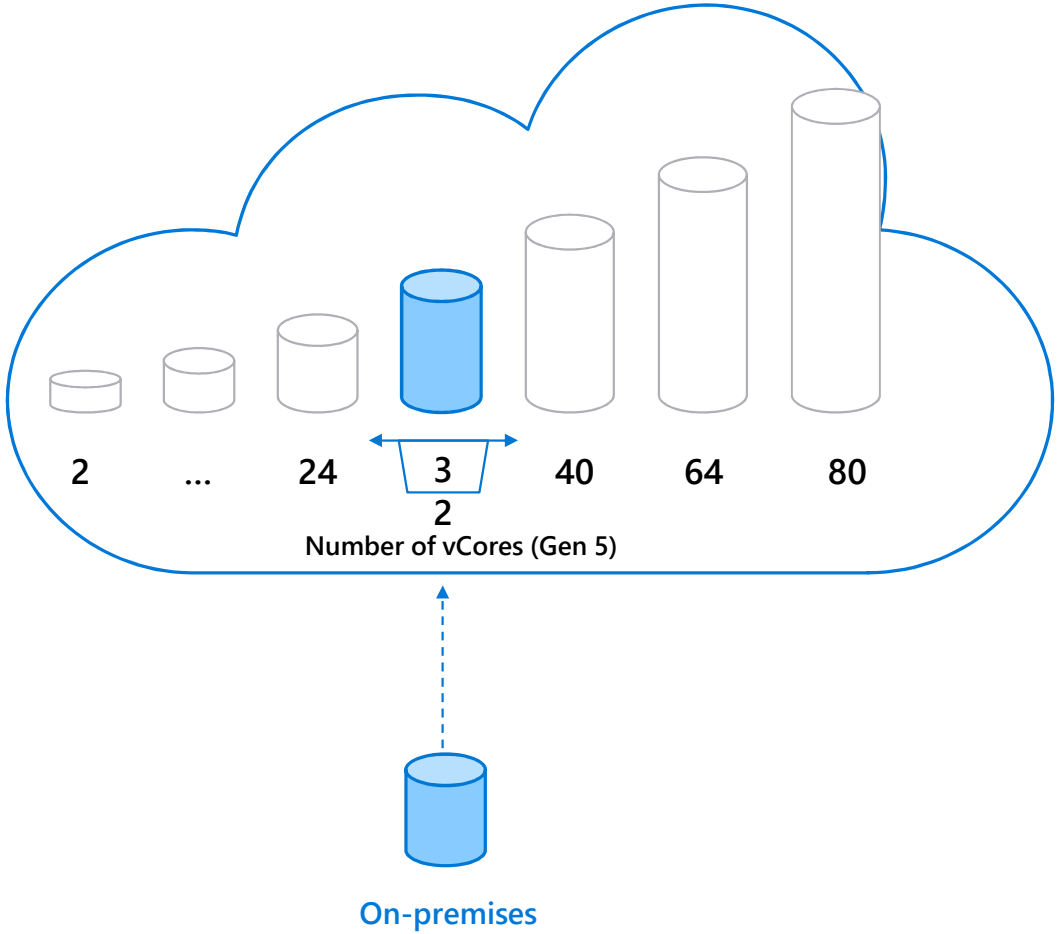
	Gen 4	Gen 5
Hardware	Intel E5-2673 v3 (Haswell) 2.4 GHz processors **vCore = 1 PP (physical core)**	Intel E5-2673 v4 (Broadwell) 2.3 GHz processors, fast eNVM SSD **vCore=1 LP (hyper-thread)**
Performance levels	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 16, 24 vCores	2, 4, 6, 10, 12, 14, 16, 18, 20, 24, 32, 40, 80 vCores
Memory	**7 GB per vCore**	**5.1 GB per vCore**
Storage	5 GB to 4 TB with 1 GB increments.	5 GB to 4 TB with 1GB increments.
Max data IOPS	500 IOPS per vCore	500 IOPS per vCore
Max log rate (MBps)	**7,5 per 2vCores**	**3,75 per 2vCores**
Hybrid Benefit	Yes	Yes



Easier to right-size the destination environment by removing the guesswork of DTUs

Azure SQL DB vCores Model

	General Purpose	Business Critical
Target workload	For applications with typically loads. Mixed of Reads/Writes	For applications that require the highest throughput and lowest IO latency.
Storage	Premium blob storage	Local SSD storage.
IO Latency (approximate)	5-7 ms (write) 5-10 ms (read)	1-2 ms (write) 1-2 ms (read)
Max data IOPS	500 IOPS per vCore	5000 IOPS per vCore
In Memory	Not Supported	Supported
Replicas	2 Read Replicas	3 Read Replicas, 1 read-scale replica



Azure Hybrid Benefit for SQL Server

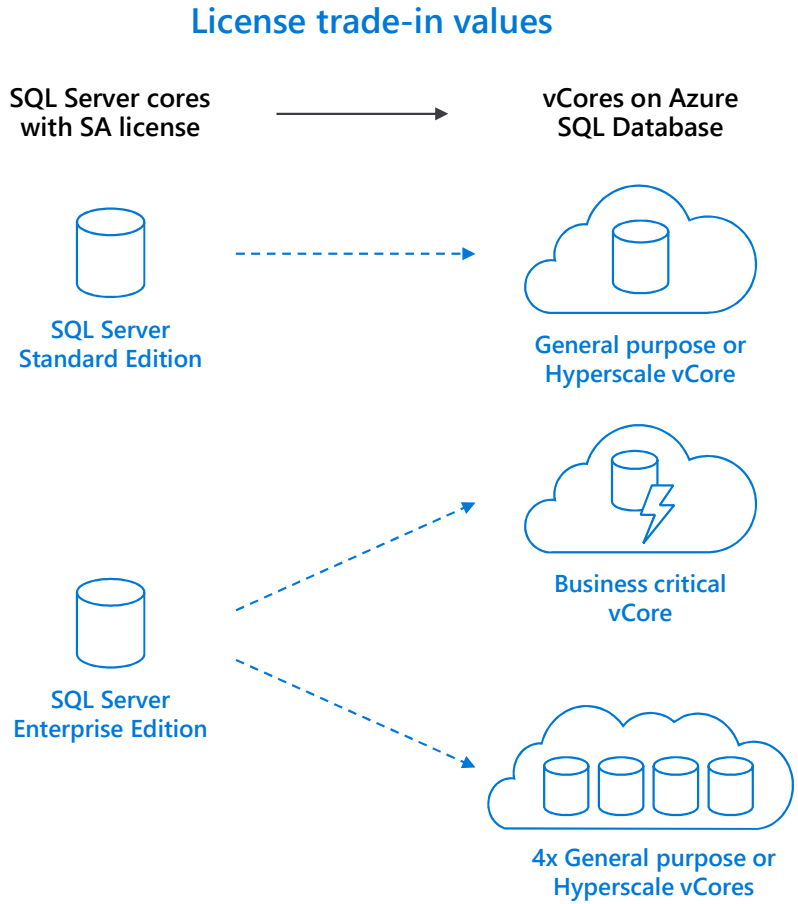
Take an inventory of on-premises licenses to determine potential for conversion

Convert on-premises cores to vCores to maximize value of investments

1 Standard license core =
1 General Purpose or Hyperscale core

1 Enterprise license core =
1 Business Critical core

1 Enterprise license core =
4 General Purpose or Hyperscale cores
(virtualization benefit)



The growing need for serverless databases

Why serverless

Compute requirements for new apps may be unknown

Developers struggle to provide sufficient capacity and resources to support apps

Managing unpredictable and intermittent workloads is costly and time-consuming

Businesses struggle to ensure that database provisioning consistently aligns with workload requirements

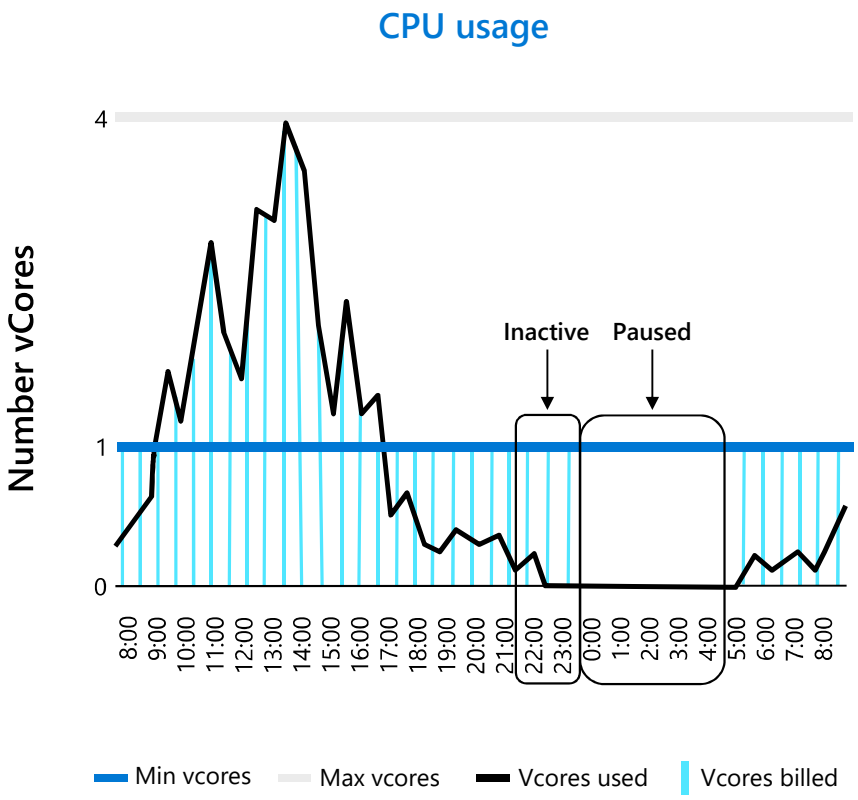
Optimize price to performance with per-second billing

Compute resources scale dynamically up or down based on workload requirements

Configure minimum and maximum vCores to define the range of available compute capacity

Use auto-pause delay to define the time period the dataset must be inactive before pausing

Pay for compute based on the vCores and memory used per second, with lowest billing based on configured vCore minimum



SQL Database serverless

On-demand flexible scale
Operate at the true rhythm of your business

Adapts compute resources to the workload without sacrificing performance

Automatically pauses and resumes

Cost-effective
Pay for performance. Period.

Pay only for compute resources you consume, on a per-second basis

Further optimize costs with configurable compute thresholds

Fully managed & intelligent
Focus on your applications, not your infrastructure

Fully-managed and intelligent database service

Built-in 99.99% availability

Best for unpredictable and intermittent workloads on single databases, such as:

Dev/test

Line of Business

E-commerce

Provisioned compute and serverless meet different needs

Optimize compute provisioning and billing for your workload

Serverless databases...

Scale up or down to meet workload requirements, instead of pre-provisioning

Bill on a per-second basis

Common scenarios

Workloads with unpredictable and intermittent usage patterns or performance requirements

Workloads where the requirements are unknown and you can delegate compute sizing to the service

Databases with provisioned compute...

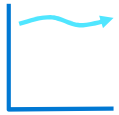
Provision compute resources upfront

Bill on an hourly basis

Common scenarios

Workloads with regular and substantial compute utilization

Multiple databases with bursty usage patterns that can be consolidated into a single server and use *elastic pools* for better price optimization



Scaling multiple databases across shared resources with elastic pools

Azure SQL DB eDTU Model

Elastic databases in elastic database pools

Pooled resources are used by many databases

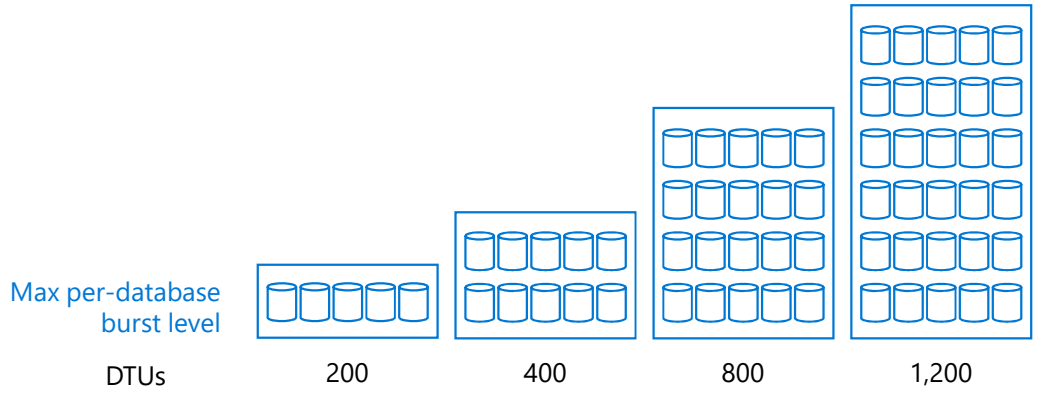
Standard elastic database pools provide 50-3000 database throughput units (DTUs) for up to 500 databases

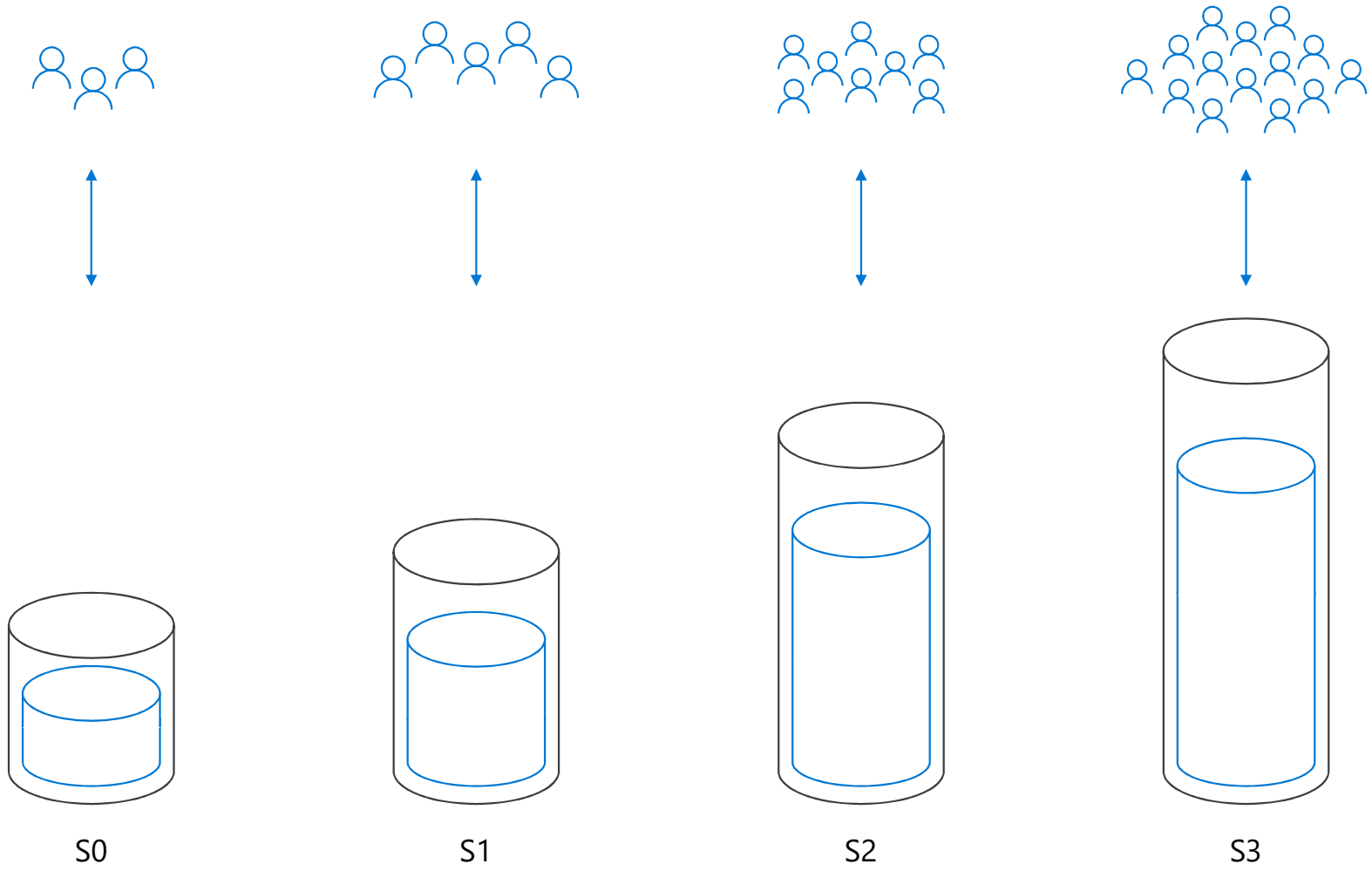
Max eDTUs per database can be set if available based on utilization by other database in the pool

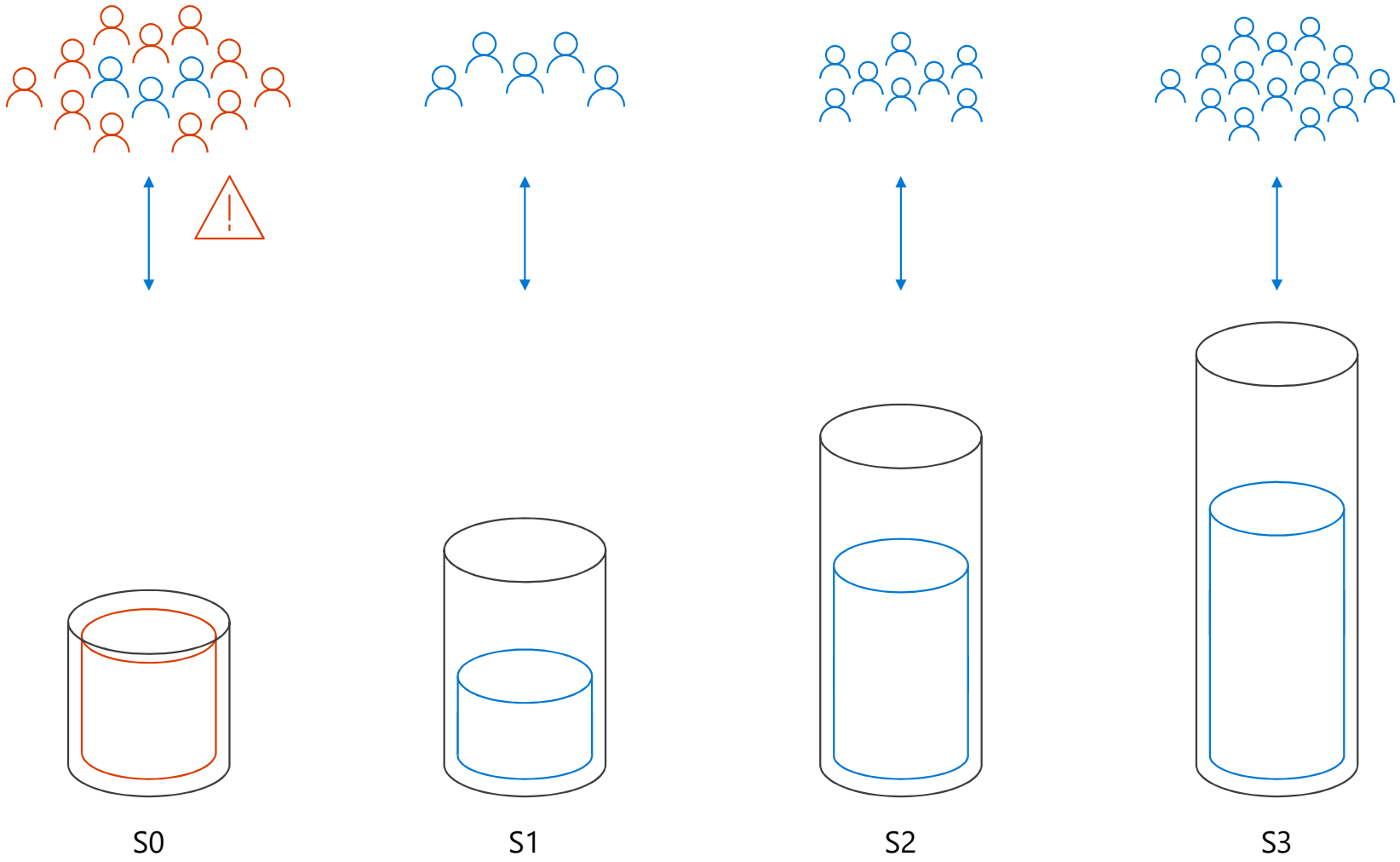
Databases remain online throughout

Monitoring and alerting available on both pools and databases

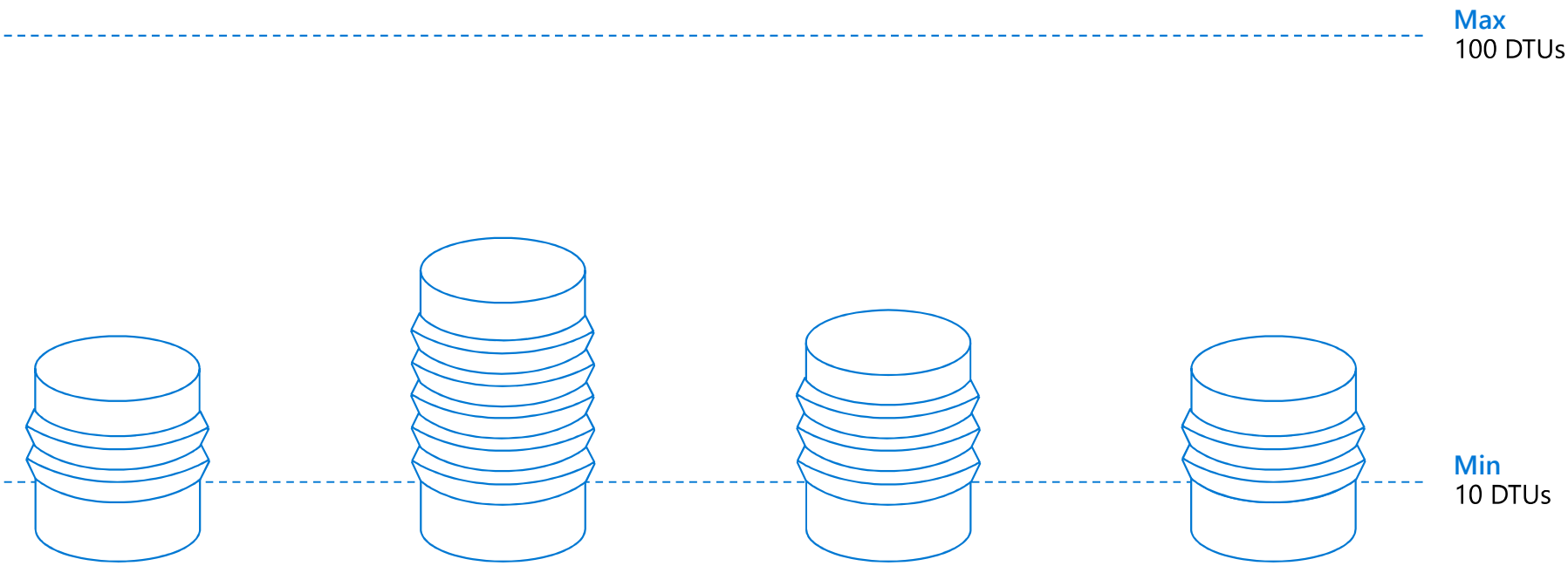
Model Based on DTU or on vCore




S0
S1
S2
S3


S0
S1
S2
S3

Elastic database pool

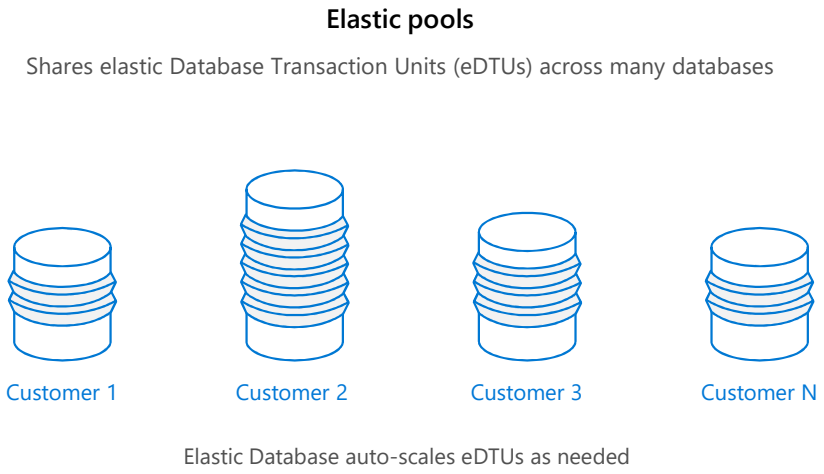


Auto-scaling you control with Elastic Database

Pools automatically scale performance and storage capacity for elastic databases—anytime, anywhere

Control the performance assigned to a pool, add or remove elastic databases on demand, and define performance of elastic databases without effecting overall pool cost

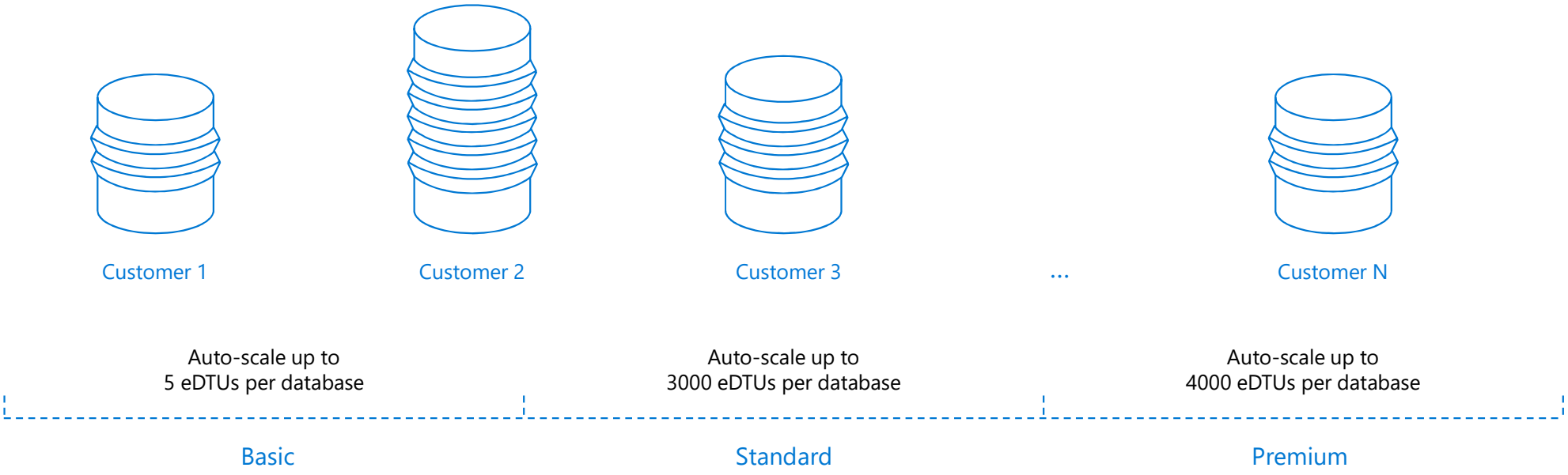
Don’t worry about managing usage needs of individual databases



Elastic database pool service tiers

Buy a fixed number of eDTUs, share compute across many databases

ELASTIC DATABASE POOLS



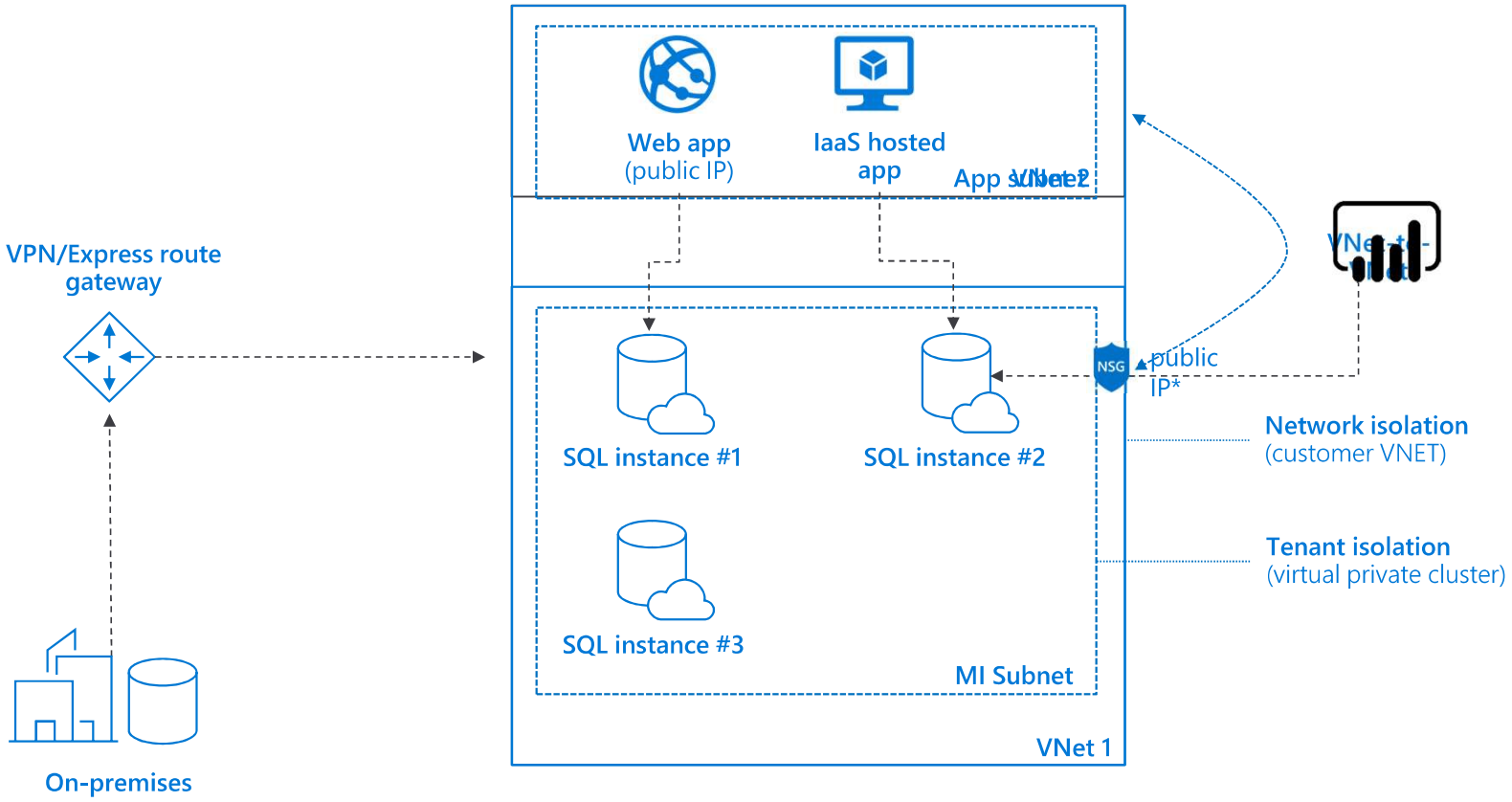
Azure SQL Database Managed Instance

Who is Managed Instance for?

Customers looking to migrate a large number of apps from on-premise or IaaS, self-built or ISV provided, with as low migration effort as possible & cost being a crucial factor

Based on the vCore model (Gen4 and Gen5)

Isolation and connectivity of Managed Instance



Azure SQL Database
Summarize

Flexible compute, storage & performance options

Simplicity

The DTU-based model and the simplicity it offers customers who want a pre-configured solution

Flexibility:

The vCore-based model reflects our commitment to customer choice and to simplify the hybrid benefit for customers migrating from on-premises

Customers pay for:

Service tier + number of vCores

Type and amount of data storage

Number of IO

Backup storage (RA-GRS)

Service tier	General purpose		Business critical		Hyperscale
Best for	Most **budget-oriented** workloads		Critical business applications with **high IO requirements**.		**VLDB OLTP and HTAP workloads** with highly scalable storage and read-scale requirements
Deployment option	Single / Elastic Pools	Managed Instance	Single / Elastic Pools	Managed Instance	Single
Compute tiers	Gen4: 1 to 24 vCore Gen5: 2 to 80 vCore	Gen4: 4 to 24 vCore Gen5: 4 to 80 vCore	Gen4: 1 to 24 vCore Gen5: 2 to 80 vCore	Gen4: 4 to 24 vCore Gen5: 4 to 80 vCore	Gen4: 1 to 24 vCore Gen5: 2 to 80 vCore
Storage	**Premium remote**		**Local SSD**		**Local SSD Cache**
	32GB – 8TB per instance	32GB – 8TB per instance	32GB – 4TB per instance	32GB – 8TB per instance	Scale from 5GB to 100TB of storage in 1GB increments
In-Memory	Not supported		Supported		Not supported
Read-write IO	~2ms for all data access		<0.5ms for all data access		<0.5ms for hot data access ~2ms otherwise
Availability	2 read replicas		3 replicas, 1 read-scale replica, zone-redundant HA		Primary read/write replica + up to 4 read replicas
Backups	RA-GRS, 7-35 days (7 days by default)		RA-GRS, 7-35 days (7 days by default)		LRS, ZRS, RA-GRS, 7-35 days (7 days by default)

For latest information reference: https://azure.microsoft.com/en-us/pricing/details/sql-database/

Pay only for what you need

DTUs			vCores		
Basic	**Standard**	**Premium**	**General Purpose**	**Business Critical**	**Hyperscale**
Small databases particularly those in development phases	General purpose databases with moderate performance requirements	Mission-critical databases with high performance and high-availability requirements	Data applications with basic IO and basic availability requirements	Business critical data applications with fast IO and high availability requirements	VLDB OLTP and HTAP workloads with highly scalable storage and read-scale requirements

Elastic scale and performance: Three service tiers within DTU-based model, and two tiers within vCore-based model let you scale up and down based on throughput needs, and offer better resource isolation and an improved billing experience

Business continuity and data protection: A spectrum of business-continuity features across tiers lets you dial up control over data recovery and failover

Familiar and fully-managed: Near-complete SQL Server compatibility and unprecedented efficiencies as your applications scale with a near-zero maintenance service and a variety of familiar management tools and programmatic APIs

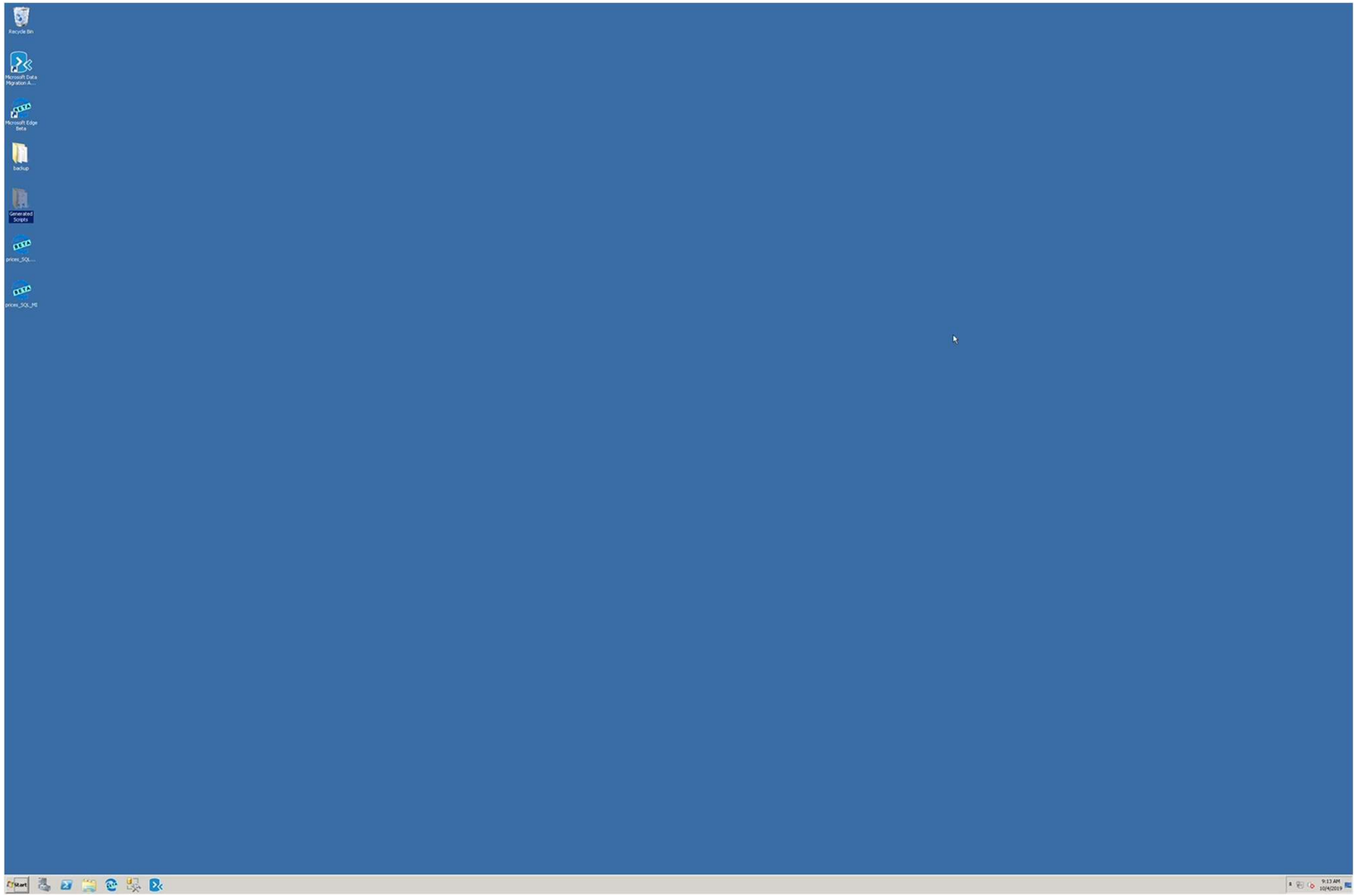
Migrate from DTU to vCore

Current service tier	Target service tier	Migration type	User actions
Standard	General purpose	Lateral	Can migrate in any order, but need to ensure appropriate vCore sizing*
Premium	Business critical	Lateral	Can migrate in any order, but need to ensure appropriate vCore sizing*
Standard	Business critical	Upgrade	Must migrate secondary first
Business critical	Standard	Downgrade	Must migrate primary first
Premium	General purpose	Downgrade	Must migrate primary first
General purpose	Premium	Upgrade	Must migrate secondary first
Business critical	General purpose	Downgrade	Must migrate primary first
General purpose	Business critical	Upgrade	Must migrate secondary first

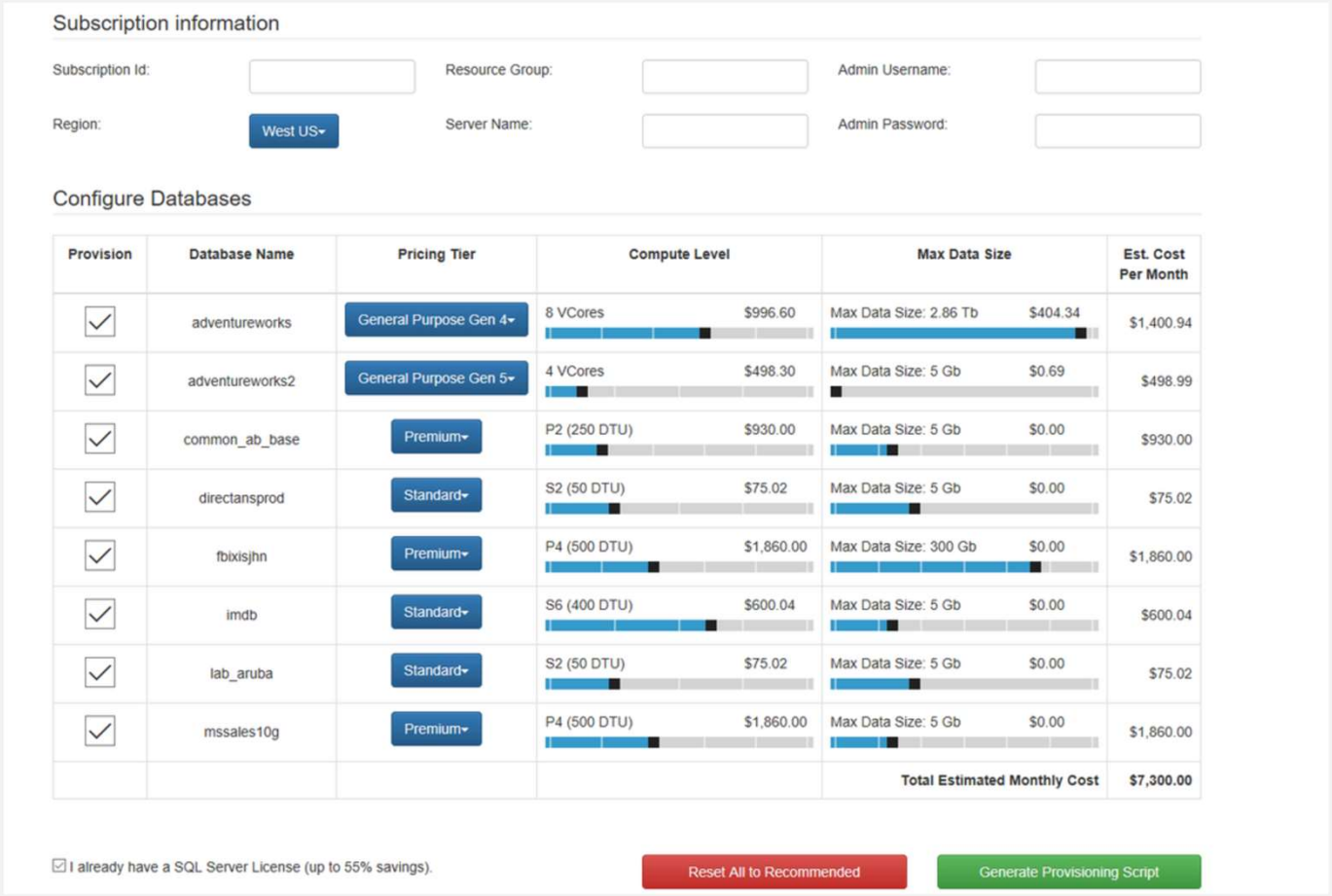
Data Migration Assistant

DEMO

Microsoft Data Migration Assistant



Azure SKU Recommendations



Subscription information

Subscription Id:

Resource Group:

Admin Username:

Region: West US

Server Name:

Admin Password:

Configure Databases

Provision	Database Name	Pricing Tier	Compute Level	Max Data Size	Est. Cost Per Month
☑	adventureworks	General Purpose Gen 4	8 VCores $996.60	Max Data Size: 2.86 Tb $404.34	$1,400.94
☑	adventureworks2	General Purpose Gen 5	4 VCores $498.30	Max Data Size: 5 Gb $0.69	$498.99
☑	common_ab_base	Premium	P2 (250 DTU) $930.00	Max Data Size: 5 Gb $0.00	$930.00
☑	directansprod	Standard	S2 (50 DTU) $75.02	Max Data Size: 5 Gb $0.00	$75.02
☑	fbixisjhn	Premium	P4 (500 DTU) $1,860.00	Max Data Size: 300 Gb $0.00	$1,860.00
☑	imdb	Standard	S6 (400 DTU) $600.04	Max Data Size: 5 Gb $0.00	$600.04
☑	lab_aruba	Standard	S2 (50 DTU) $75.02	Max Data Size: 5 Gb $0.00	$75.02
☑	mssales10g	Premium	P4 (500 DTU) $1,860.00	Max Data Size: 5 Gb $0.00	$1,860.00
				Total Estimated Monthly Cost	**$7,300.00**

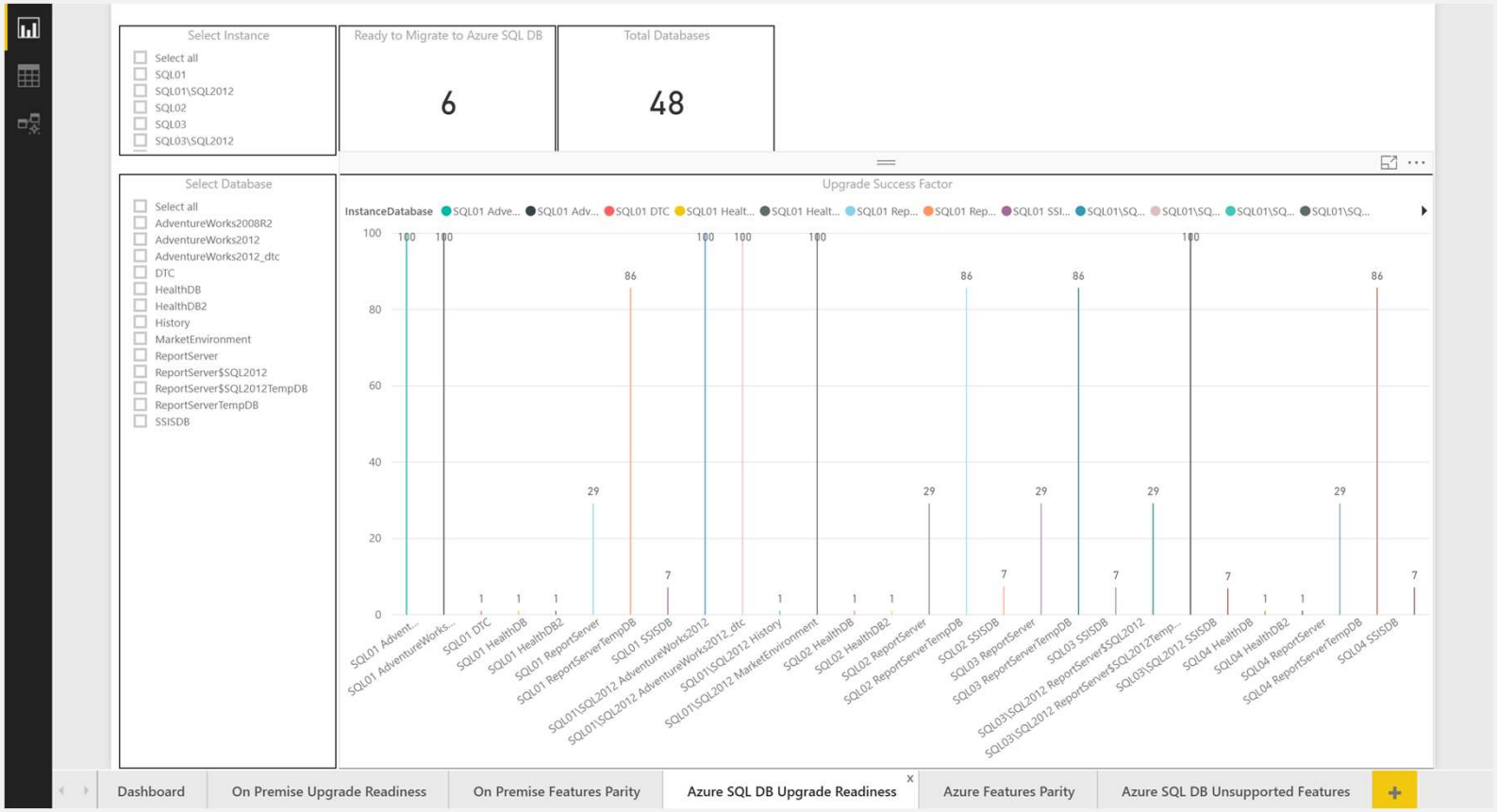
☑ I already have a SQL Server License (up to 55% savings).

Reset All to Recommended

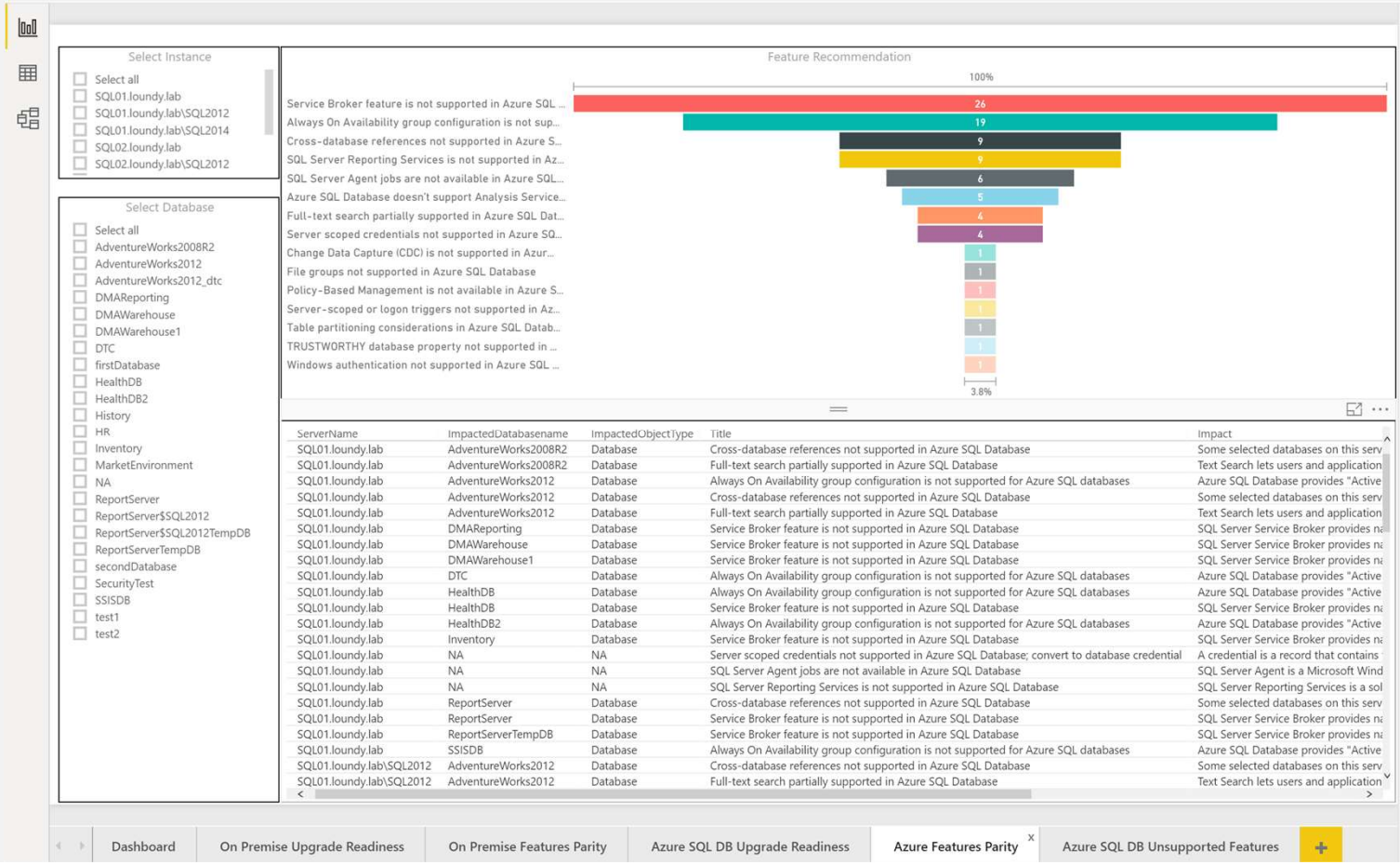
Generate Provisioning Script

DMA Reports Dashboard

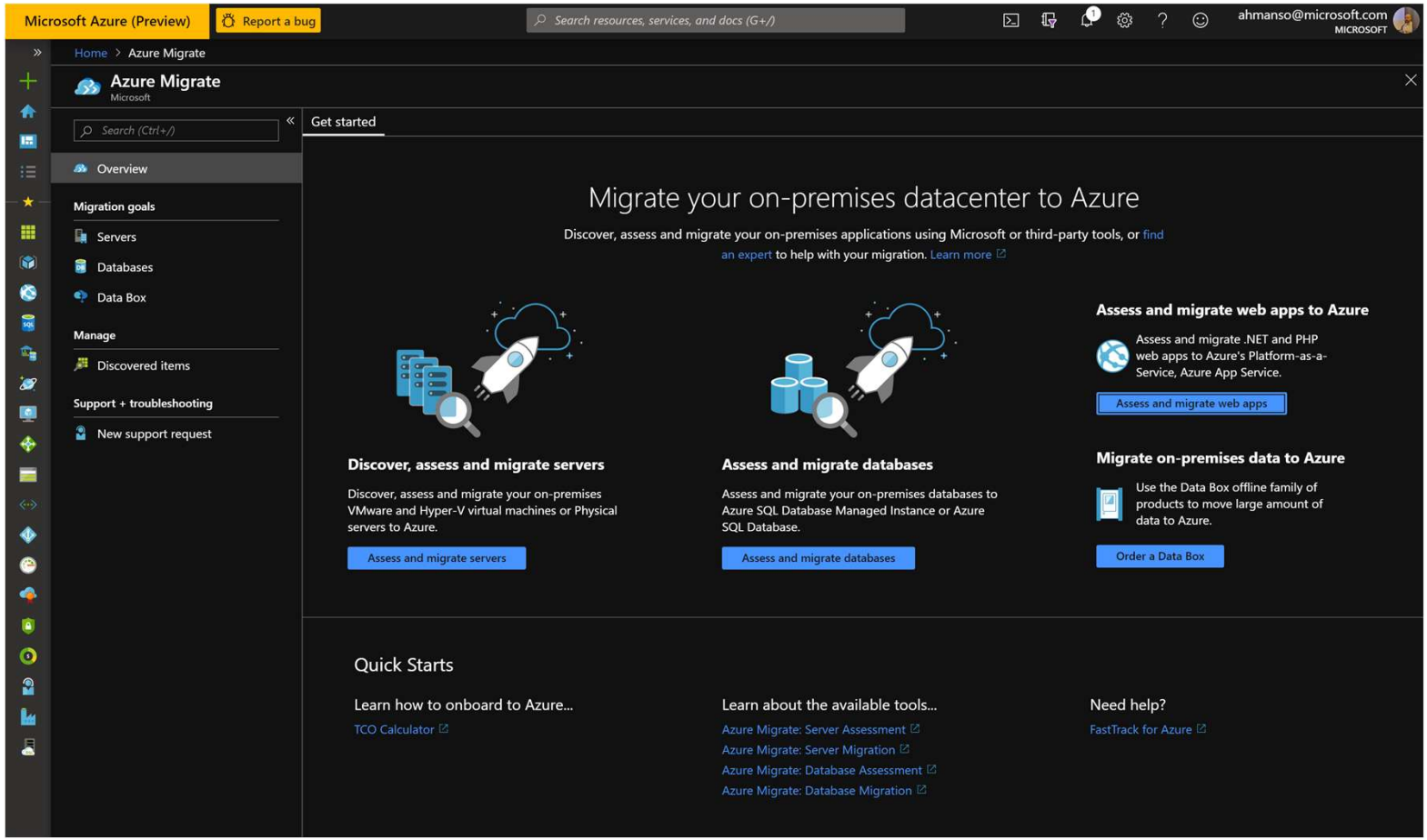
Azure SQL DB Upgrade Readiness



Azure Features Parity



Azure Migrate



Database migrations

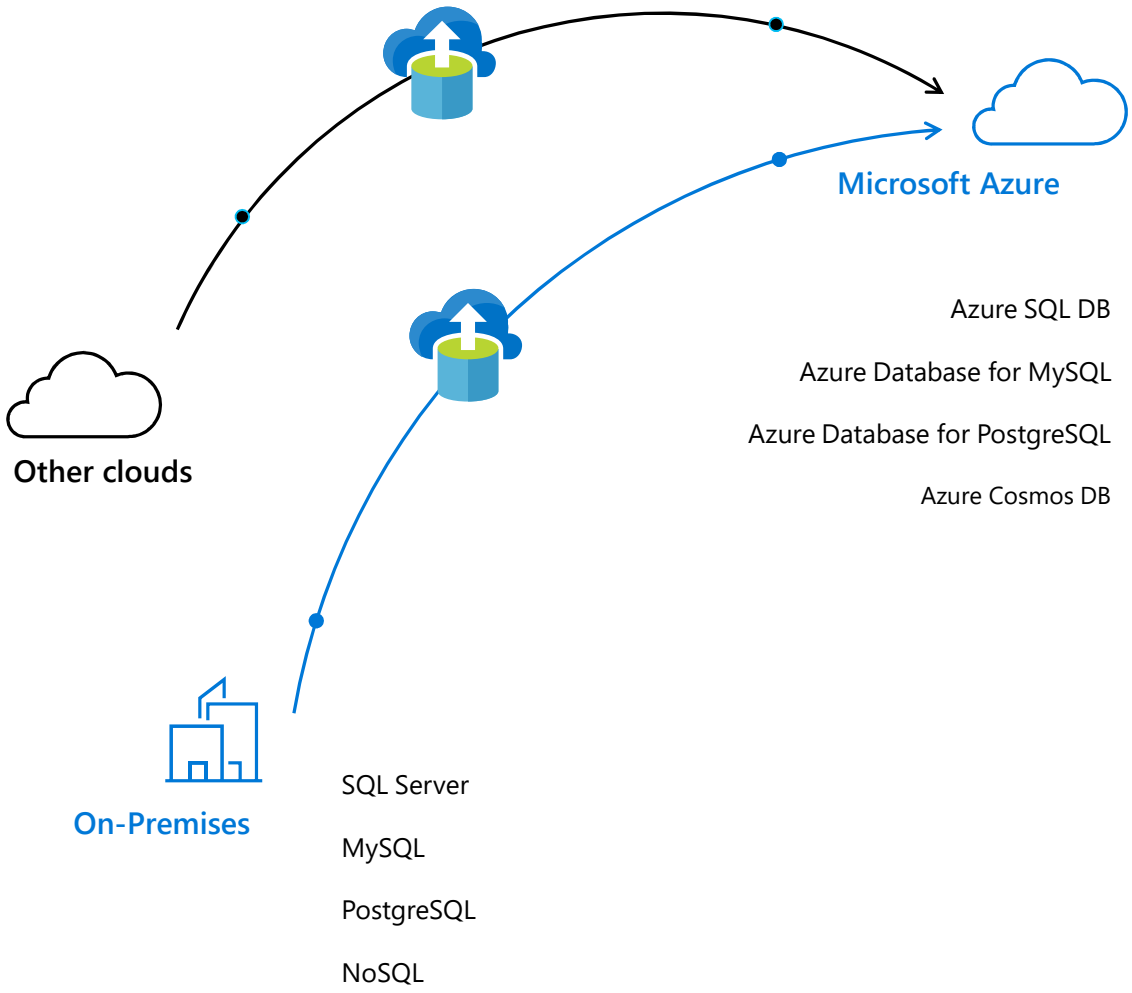
1. Migrate SQL Server to Azure SQL Database for best TCO

2. Migrate open source databases to fully managed MySQL and PostgreSQL services in Azure

3. Migrate any NoSQL database to Azure Cosmos DB for global distribution

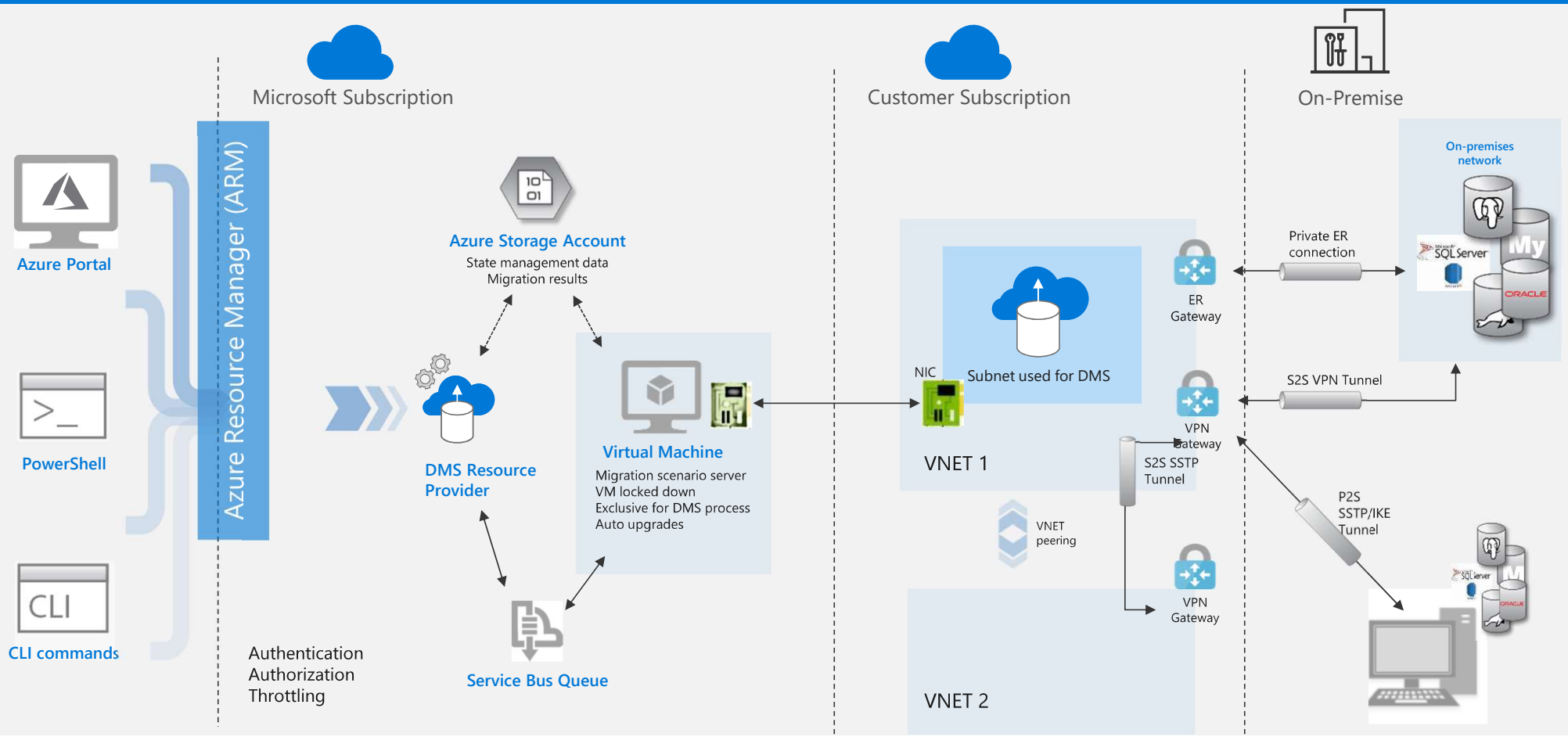
Azure Database Migration Service
http://aka.ms/get-dms

Database Migration Guide
http://aka.ms/datamigration



Data Migration Service

Azure Database Migration Service



Choice of tools for every stage and every requirement

Microsoft

Assess

Azure Migrate

Data Migration Assistant

SQL Server Migration Assistant

Migrate

Azure Site Recovery

Azure Database Migration Service

Azure Data Box

Optimize

Azure security and management (security, backup, monitoring, cost management)

Partners

MOVERE
Cloudamize
CloudAtlas®
BitTitan
STRATOZONE®
turbonomic
CloudEndure®
Ispirer
Corent
intigua
stiim
ATTUNITY
DATOMETRY
MORPHIS
Informatica
QuerySurge

And there’re more database providers

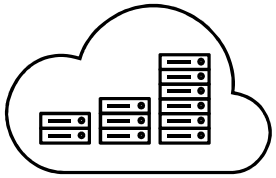
Azure Database Services for MYSQL, POSTGRESQL, and MARIADB

More choices and full integration into Azure's ecosystem and services

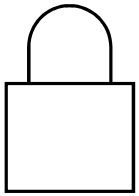
Managed community MySQL, PostgreSQL, and MariaDB

Languages and frameworks of your choice

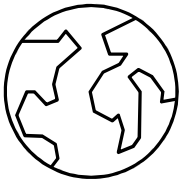
Scale in seconds with built-in high availability



Secure and compliant



Industry-leading global reach



Easy lift and shift

Enterprise ready

Microsoft

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THANK YOU

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Cloud Solution Architect
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Erwin de Kreuk
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Session Evaluation

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QUESTIONS

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