16th Data & AI Meetup

# AZURE BOOTCAMP

## Azure SQL Database

**Bernhard Düchting**
**Cloud Solution Architect Data & AI**
**Microsoft Deutschland GmbH**
**Email: Bernhard.Duechting@microsoft.com**

https://aka.ms/gdai @DataAIHub

# Azure SQL Database

## The developer's intelligent cloud database service

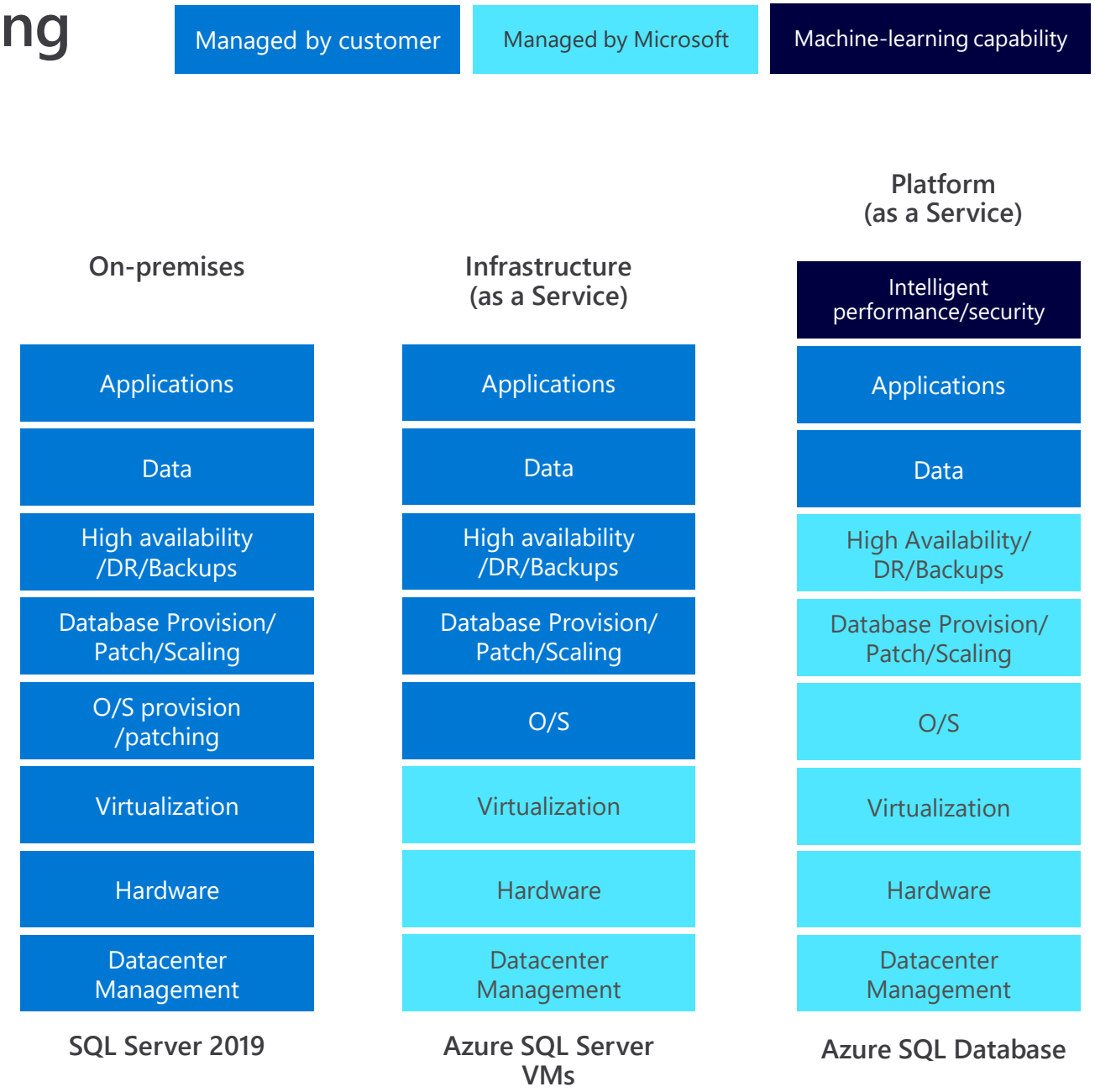
# Saving opportunity for modernizing your data estate is significant

**On-premises costs** tend to be driven by hardware and data center management costs

**Infrastructure-as-a-Service** reduces cost categories related to data center and compute

**Platform-as-a-Service** off-loads customers' most administrative tasks to Azure, further improving efficiency with machine-learning capabilities for performance and security

- **Managed Instance**: instance-level deployment for lift-shift existing apps to Azure, fully backward compatible
- **Single database**: database-level deployment for new apps



# Azure SQL Database deployment option


## Azure SQL Database

### Single

Database-scoped deployment option with predictable workload performance

**Best for** apps that require resource guarantee at database level

### Elastic Pool

Shared resource model optimized for greater efficiency of multi-tenant applications

**Best for** SaaS apps with multiple databases that can share resources at database level, achieving better cost efficiency

### Managed Instance

Instance-scoped deployment option with high compatibility with SQL Server and full PaaS benefits

**Best for** modernization at scale with low friction and effort

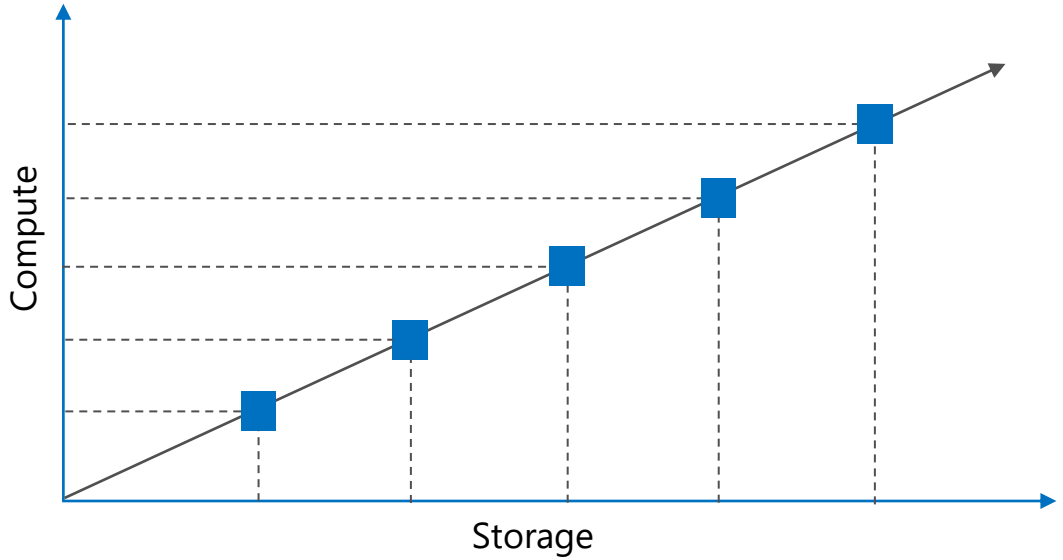
Service Tiers

- General Purpose
- Business Critical
- Hyperscale
- Serverless

# Flexible compute & storage options

## DTU model

Simple, preconfigured



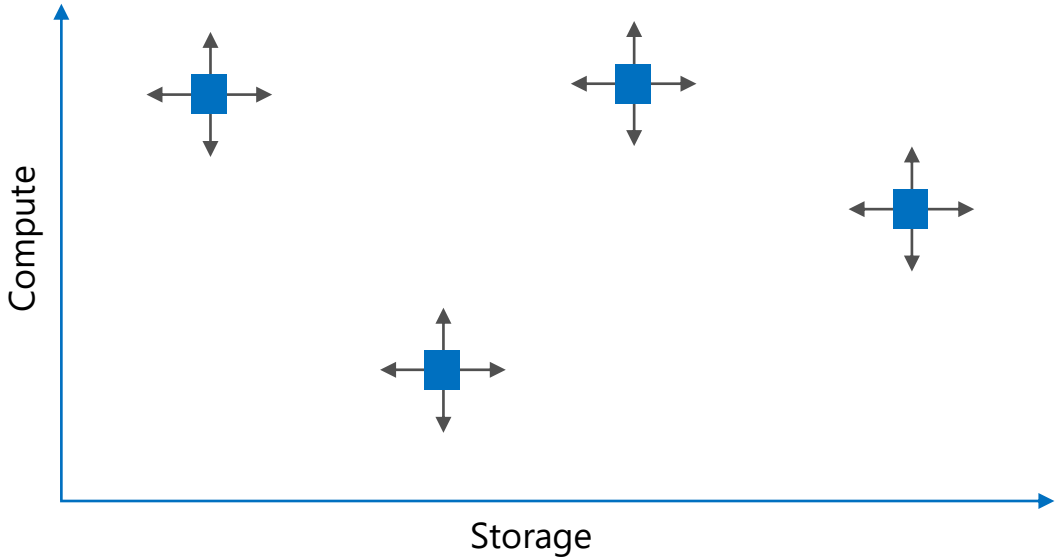

Pre-packaged, bundled unit that represents the database power

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

# Scaling multiple databases across shared resources with elastic pools

# Azure SQL Database - Elastic database 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

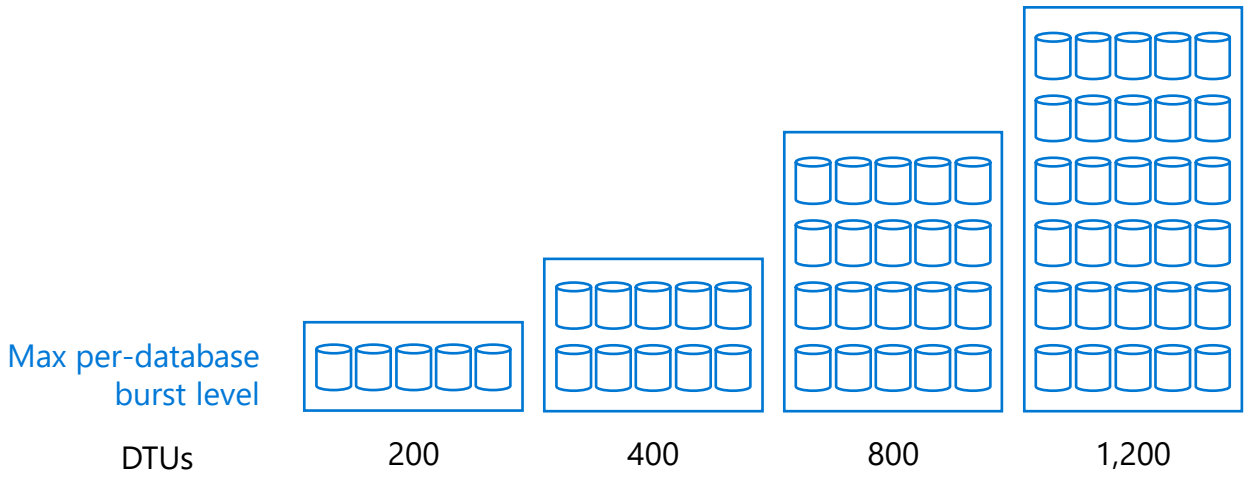
Create/configure pools using portal, Azure PowerShell, REST APIs

Move databases in/out using portal, Azure PowerShell, REST APIs, and T-SQL

Databases remain online throughout

Geo replication of databases in same of different region

Monitoring and alerting available on both pools and databases

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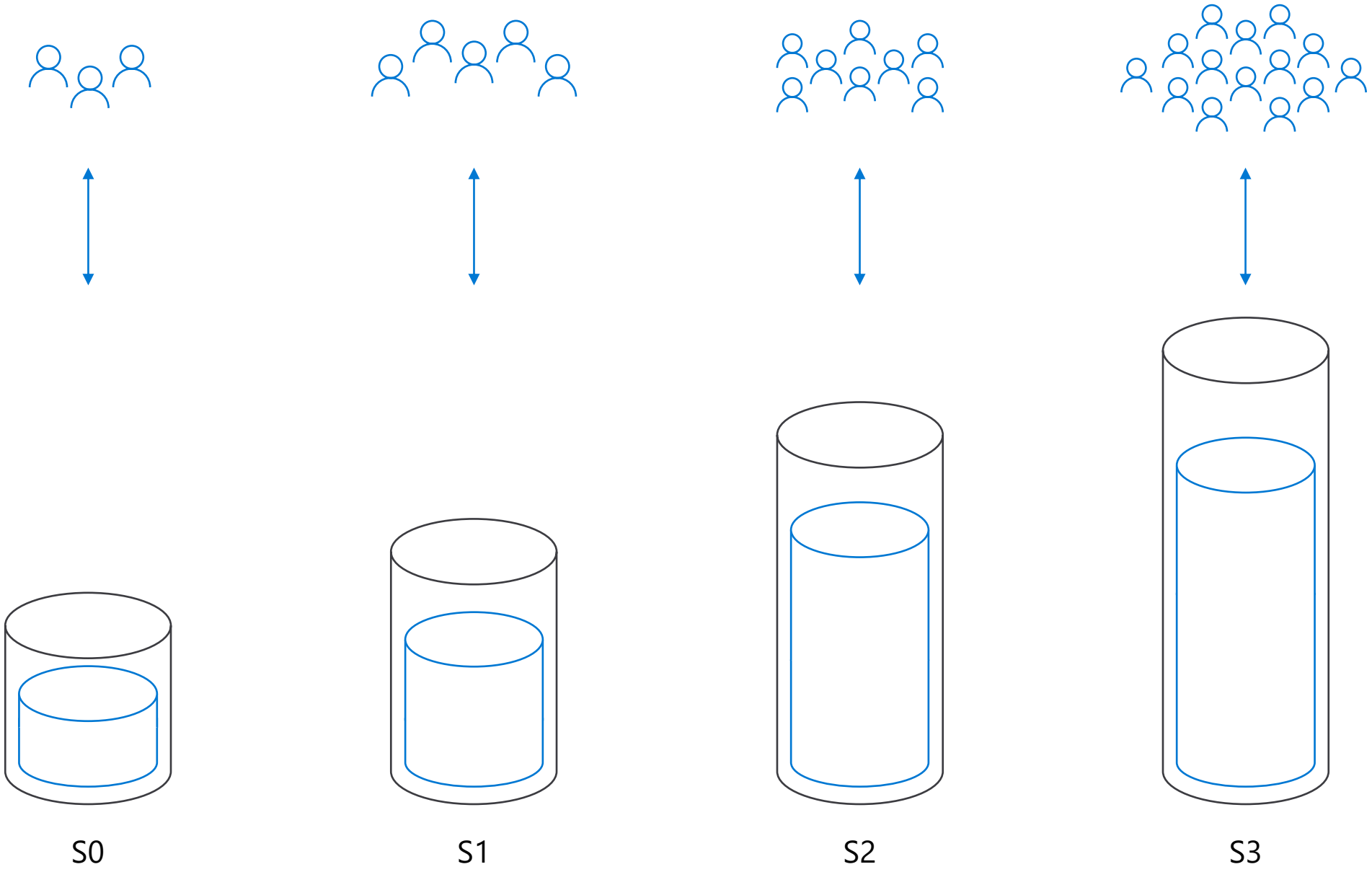
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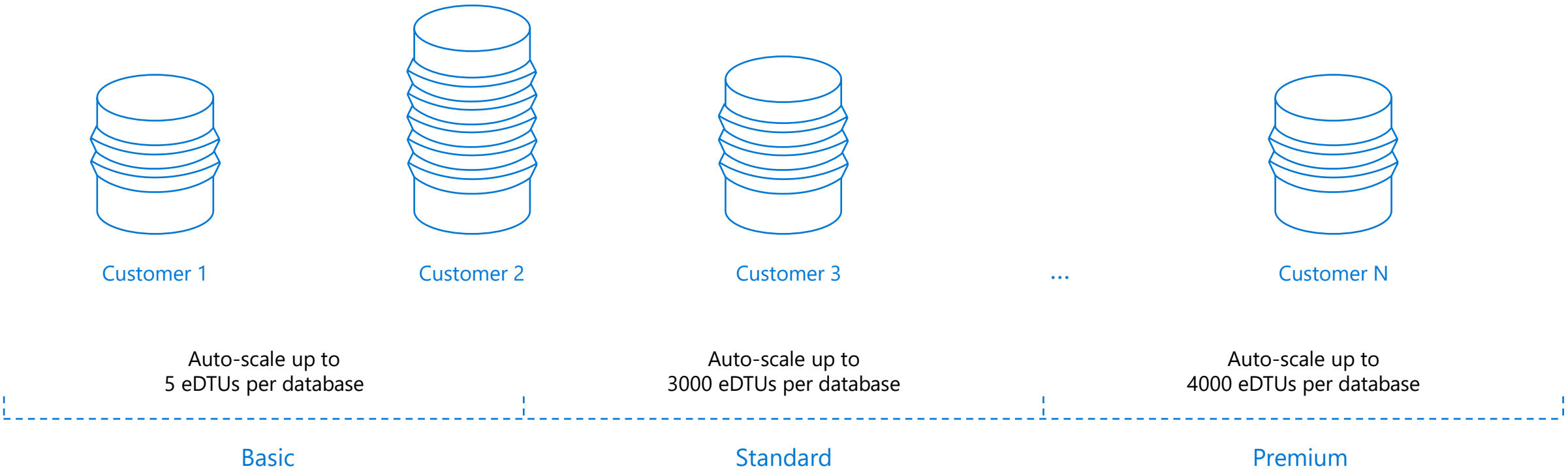
# Elastic database pool service tiers

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

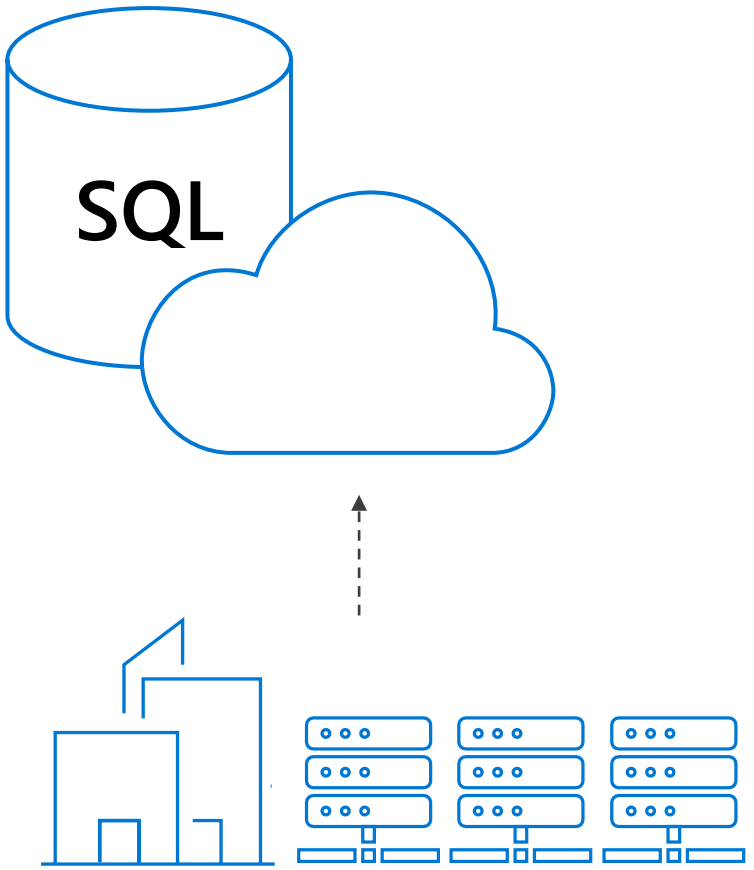
**ELASTIC DATABASE POOLS**



# 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

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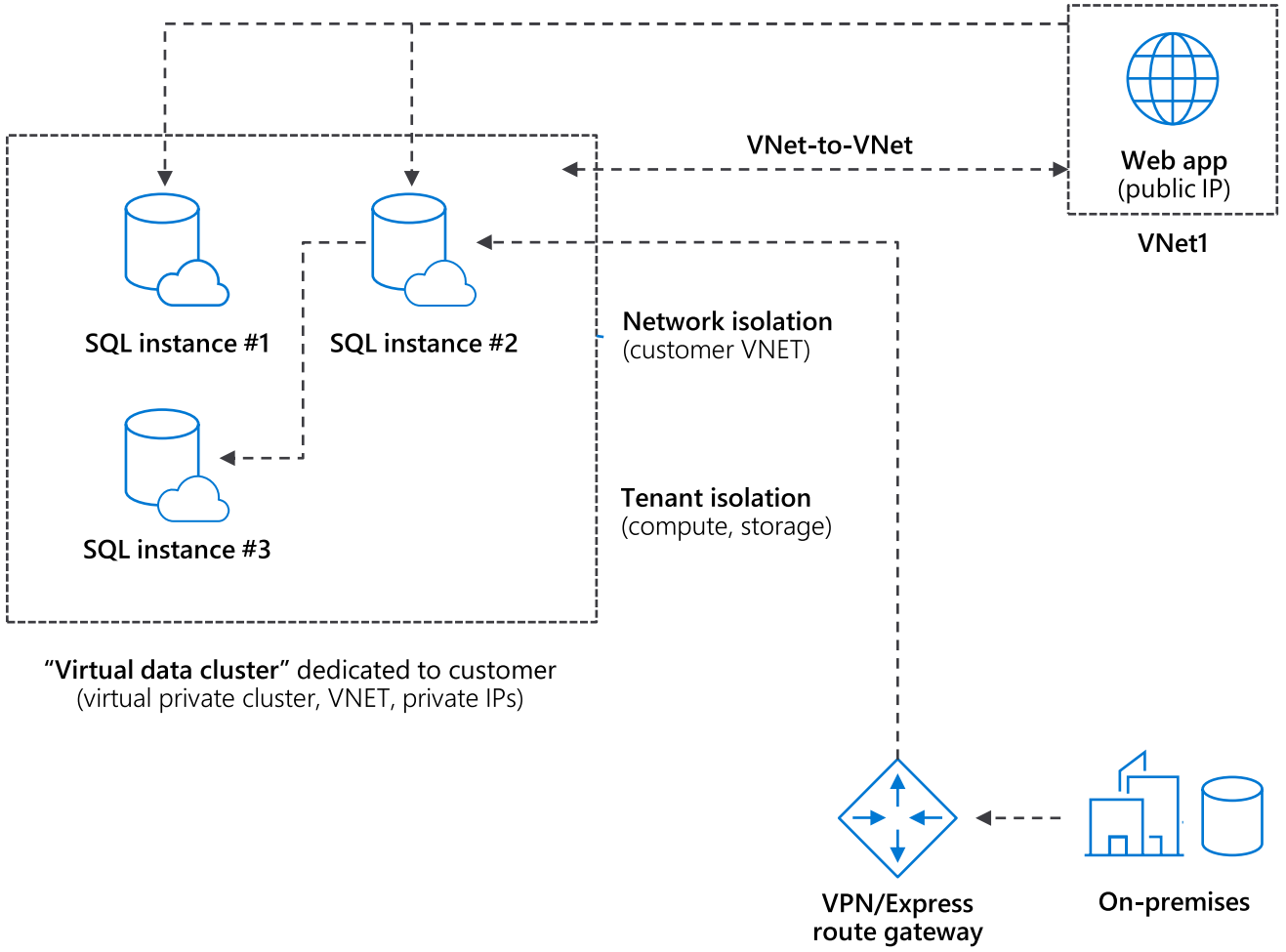
# Dedicated resources through customer isolation



# Scale your data workloads with Azure SQL Database Hyperscale

# Challenges with managing Very Large Databases (VLDB)

## Size of data

Operations take a LONG time (days in some cases)

Ongoing operations degrade database performance

Can cause outages and downtime

Provisioning more storage to expand the database can be painful

## Scaling Compute

Logistics of moving to larger box

Economics of sizing for max peaks

# Hyperscale is the foundation for massive app growth

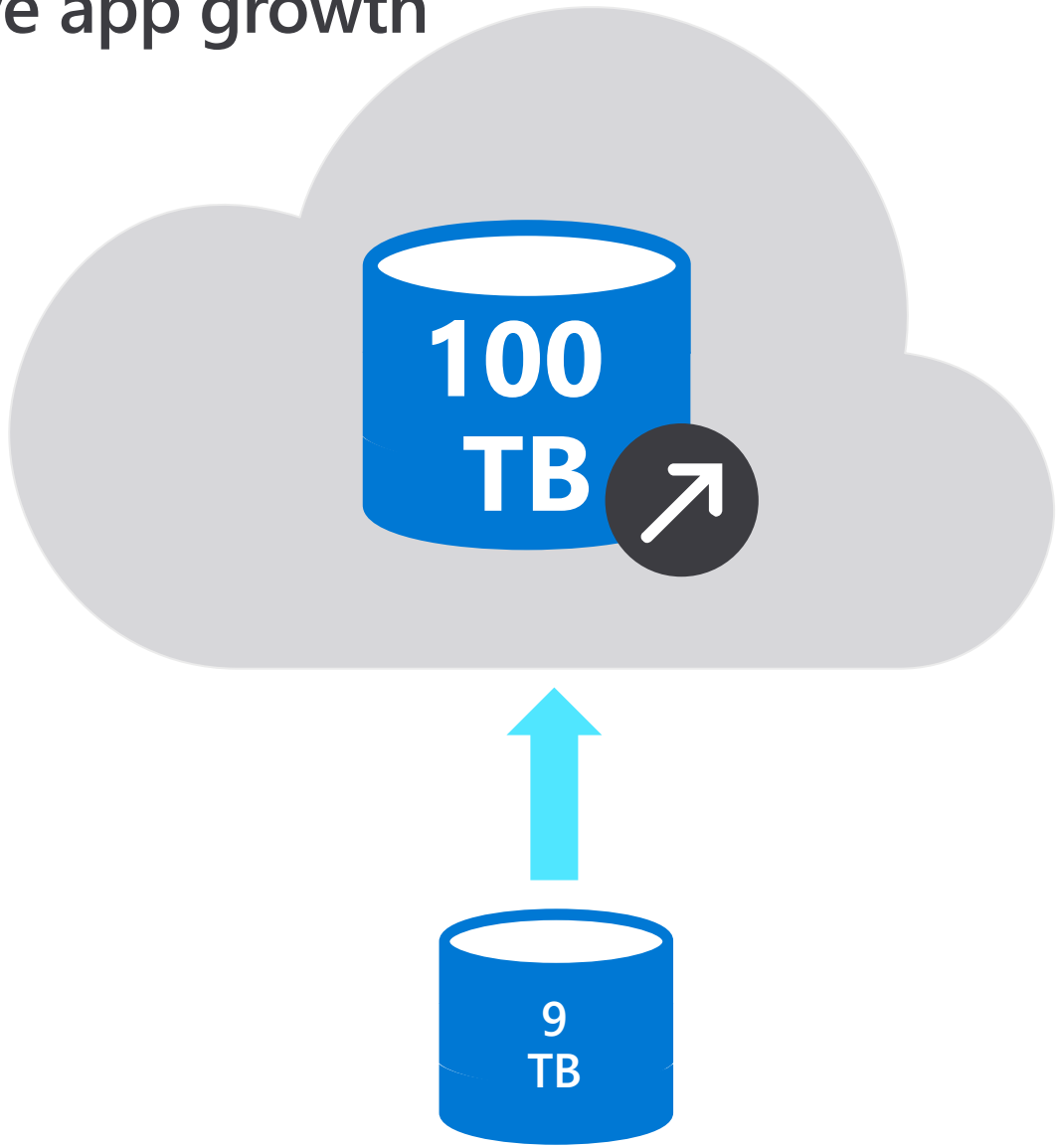
**Hyperscale is a new, highly scalable service tier that adapts on-demand to your workload's needs, auto-scaling up to 100TB per database.**

Storage dynamically adapts to your workloads' needs, auto-scaling up to 100TB.

Provision one or more additional compute nodes that can serve your read-only workload and use them as a hot-standby, in case of failover.

Perform operations in constant time, regardless of the size of the data operation.

Compute and storage resources scale rapidly and independently without sacrificing performance.

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# 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

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# Existing offerings cannot solve the problem

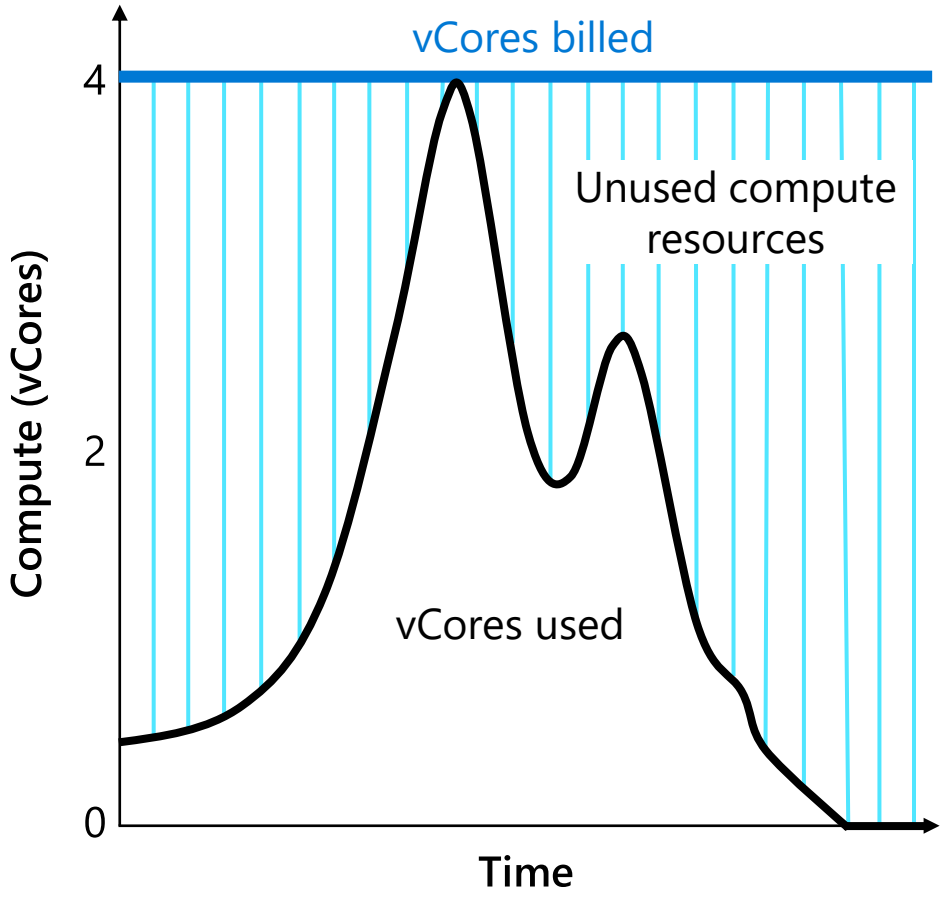
**Provisioned compute databases are designed for predictable patterns and higher compute utilization**

They struggle to meet high peaks in demand

They contribute to over-allocation of resources and costs during periods of inactivity or low usage

Lead to precious resources spent managing, not building

**Provisioned compute with unpredictable and intermittent workloads**



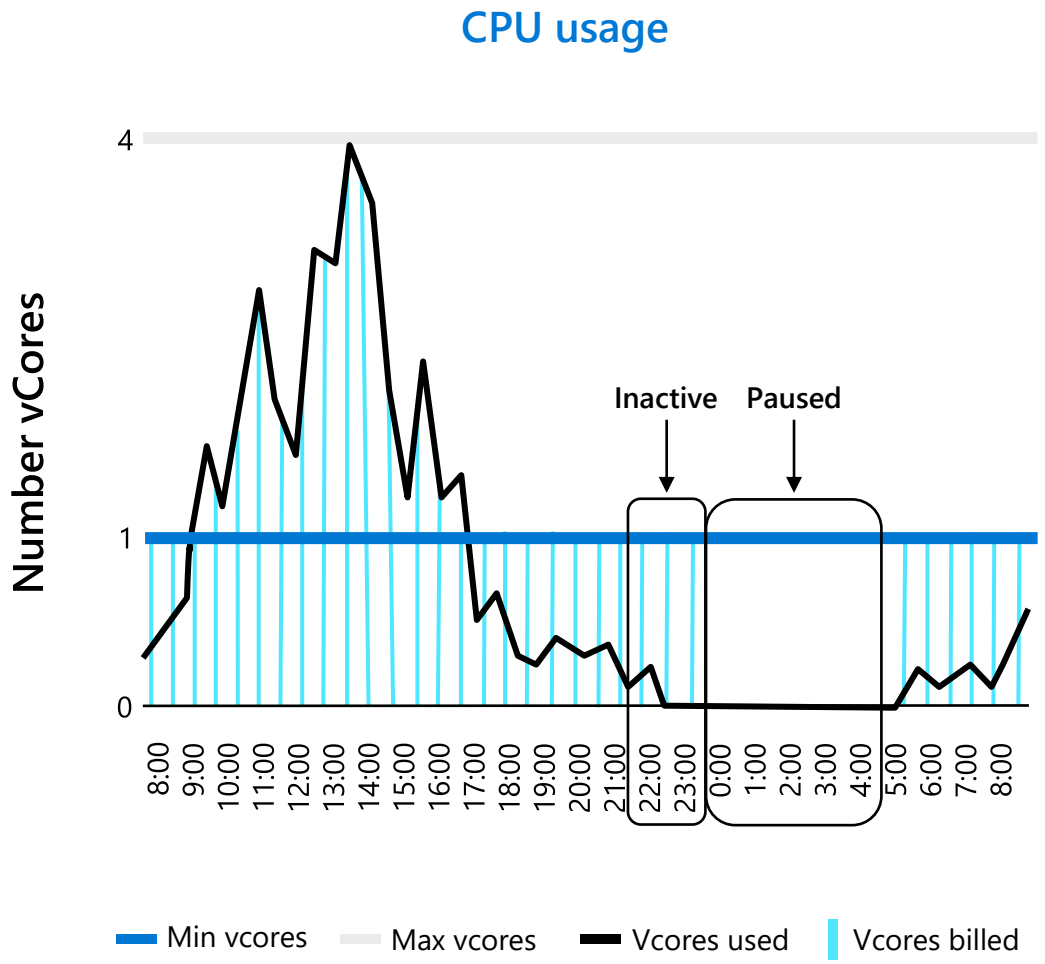
# Optimize price to performance with per-second billing

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



# Data Migration Assistant
# Seamless Migration from onPrem to IaaS to Paas

# Demo

# A hybrid Journey to the Cloud

Seamless hybrid deployment with integrated data synchronization

Reliable migration at scale

Lift and shift to the cloud with no code changes

Up to 55% cost savings