



# Azure SQL Managed Instance

A fully managed SQL Server in the cloud

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# Agenda

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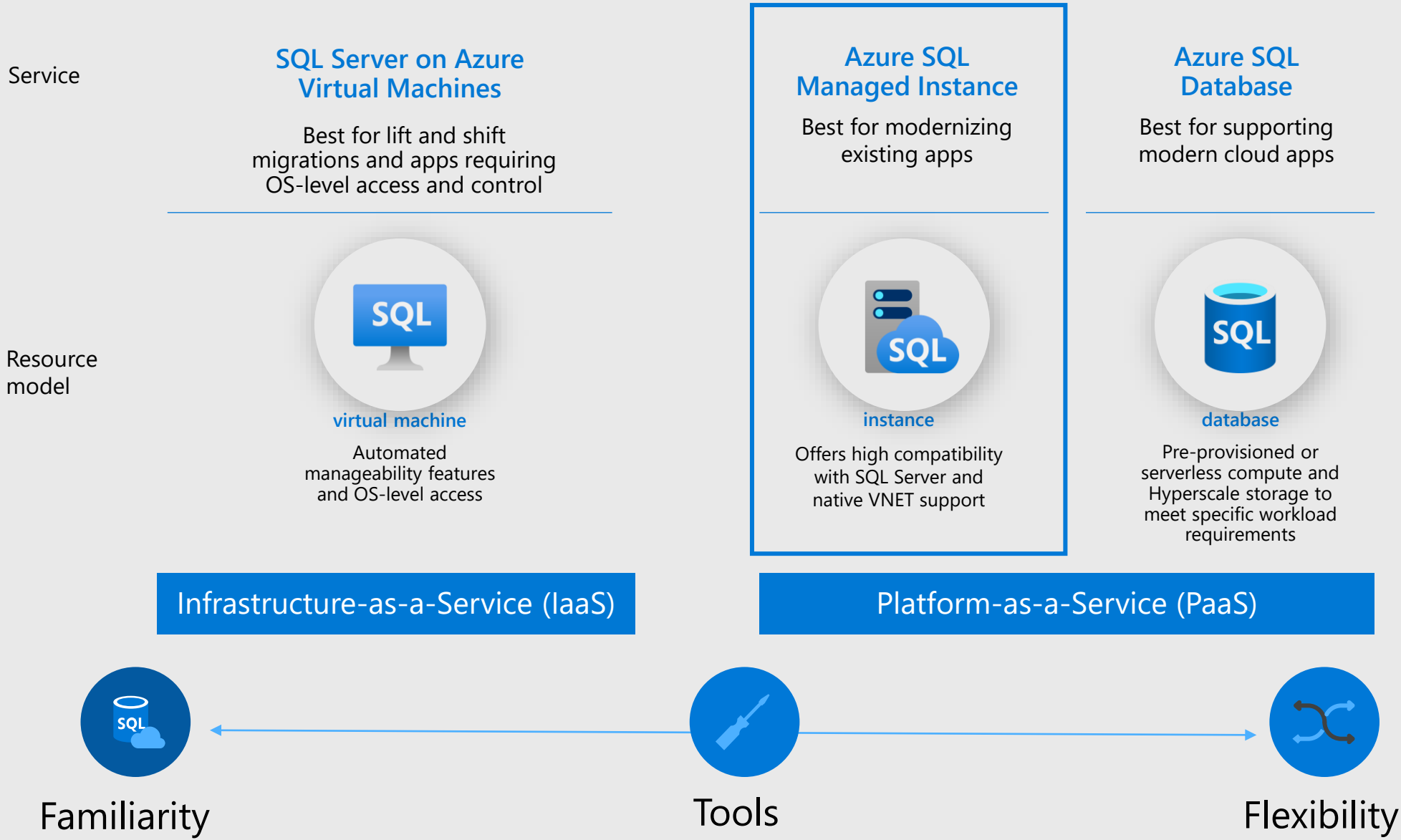
When to choose SQL Managed Instance

What to expect with SQL MI

What's new and what's coming next

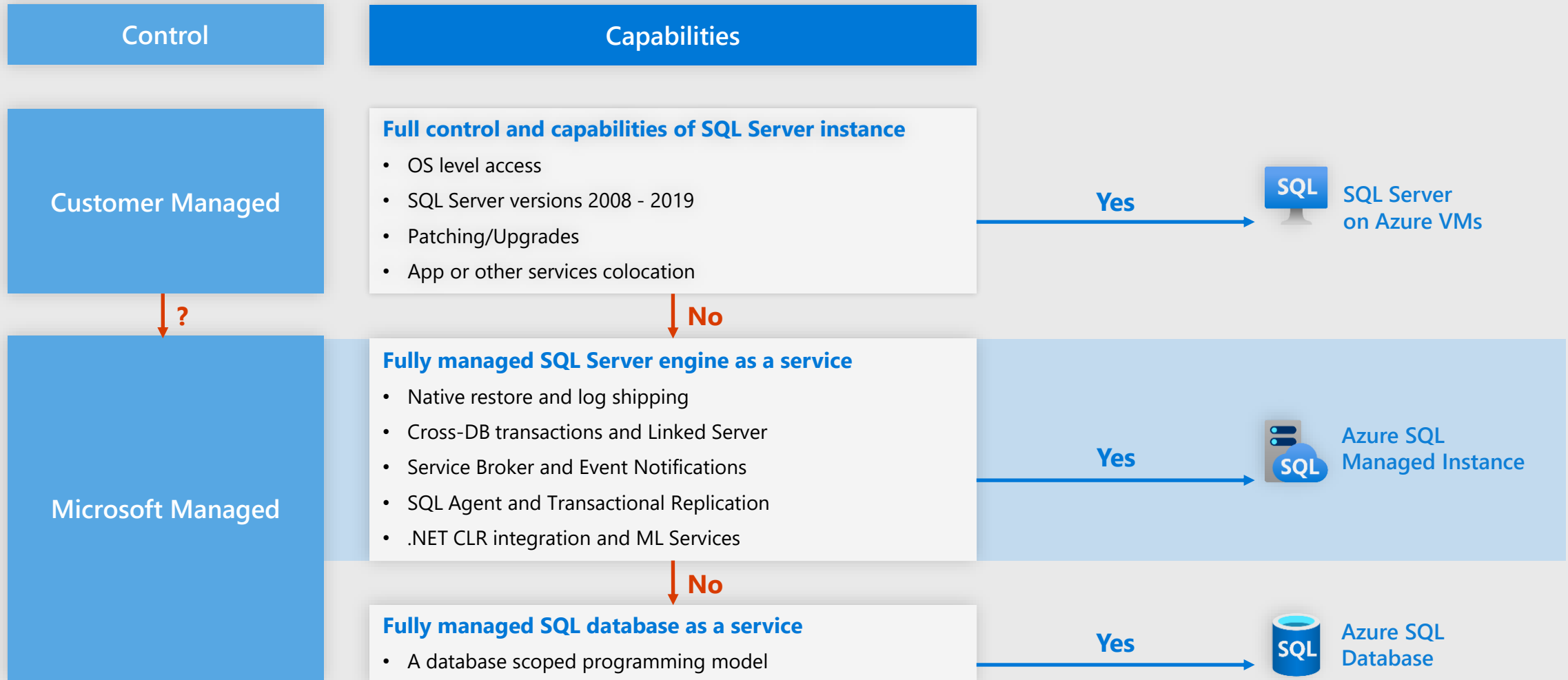
# Azure SQL

The family of SQL database services on Azure



# Which Azure SQL offering is right for you?

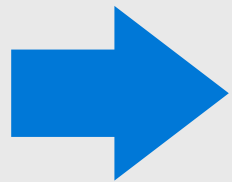
Migration, App Modernization, App Innovation




# What to expect with SQL MI



Hardware allocation,  
deployment of service  
binaries



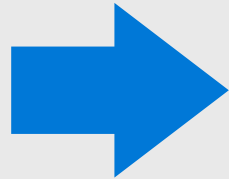
Tier selection,  
instance sizing,  
operation scheduling

 What service is  
providing for you

 What is under your  
control

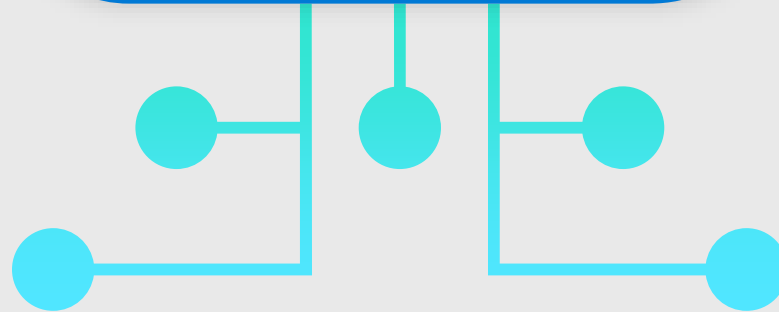


Service updates and patches (OS, SQL)



Updates of database schema, compat level change

Keeping system up-to-date



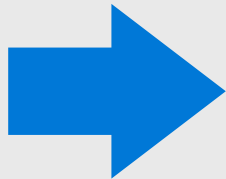
What service is providing for you



What is under your control





Service-aided subnet configuration



Filtering & routing data traffic, Express Route configuration



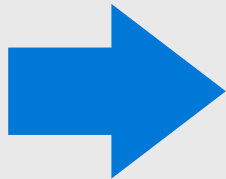
 What service is providing for you


 What is under your control





TDE, TLS, FoG, AAD

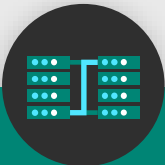


 What service is providing for you

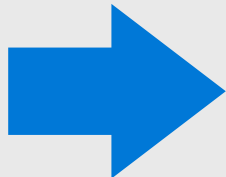
 What is under your control



BYOK for TDE




Built-in HA configuration, Geo-replicated databases (FoG), Auto-failover



Cross-region connectivity, Sizing of geo-secondary instance, Manual failover

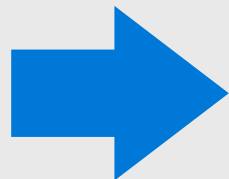


 What service is providing for you

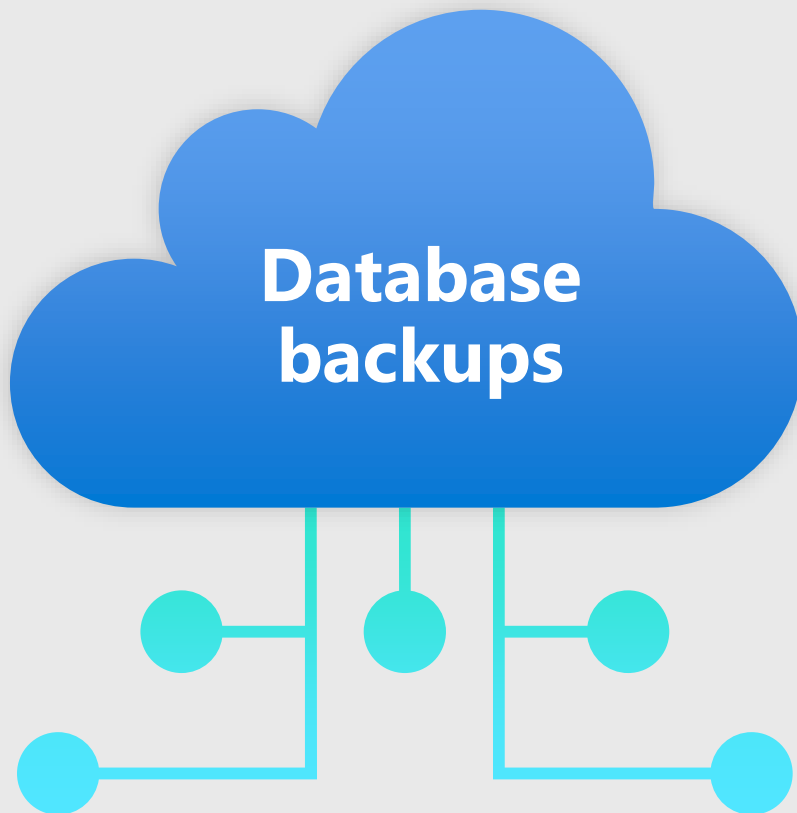
 What is under your control



Geo-replicated  
automatic backups  
(full, diff. log), LTR



Manual backups,  
recovery using PITR  
and geo-restore



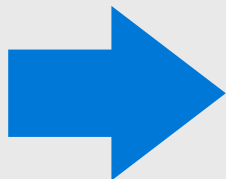
What service is  
providing for you



What is under your  
control



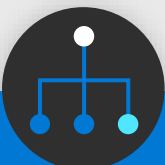
SSO AAD  
authentication



What service is  
providing for you



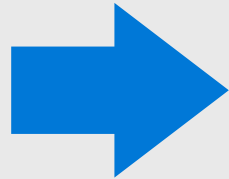
What is under your  
control



AD → AAD account  
sync (AD Connect)  
ADFS, Client drivers



Collection and streaming of performance and health metrics



Azure alerts and monitoring tool configuration

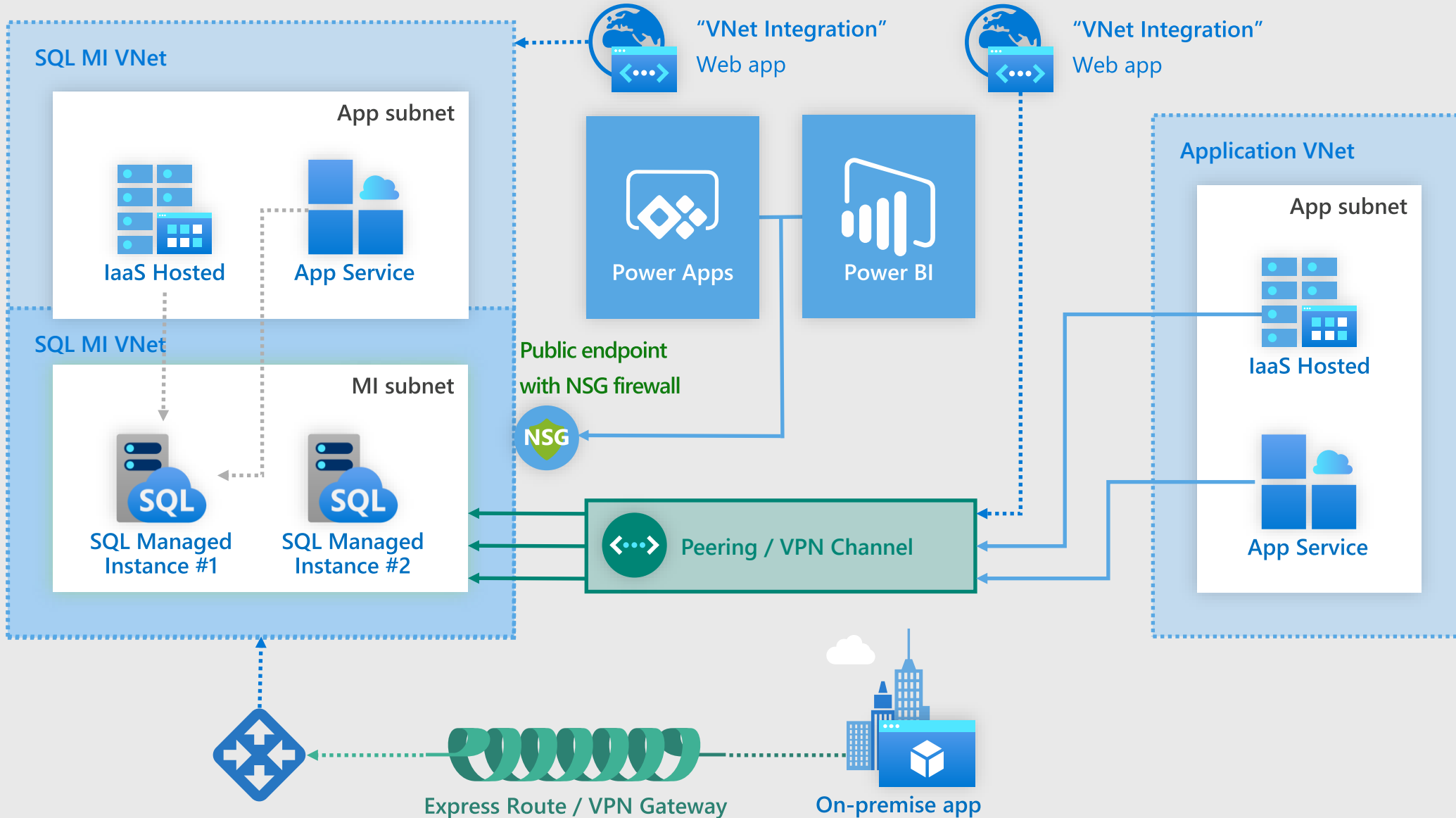


What service is providing for you



What is under your control

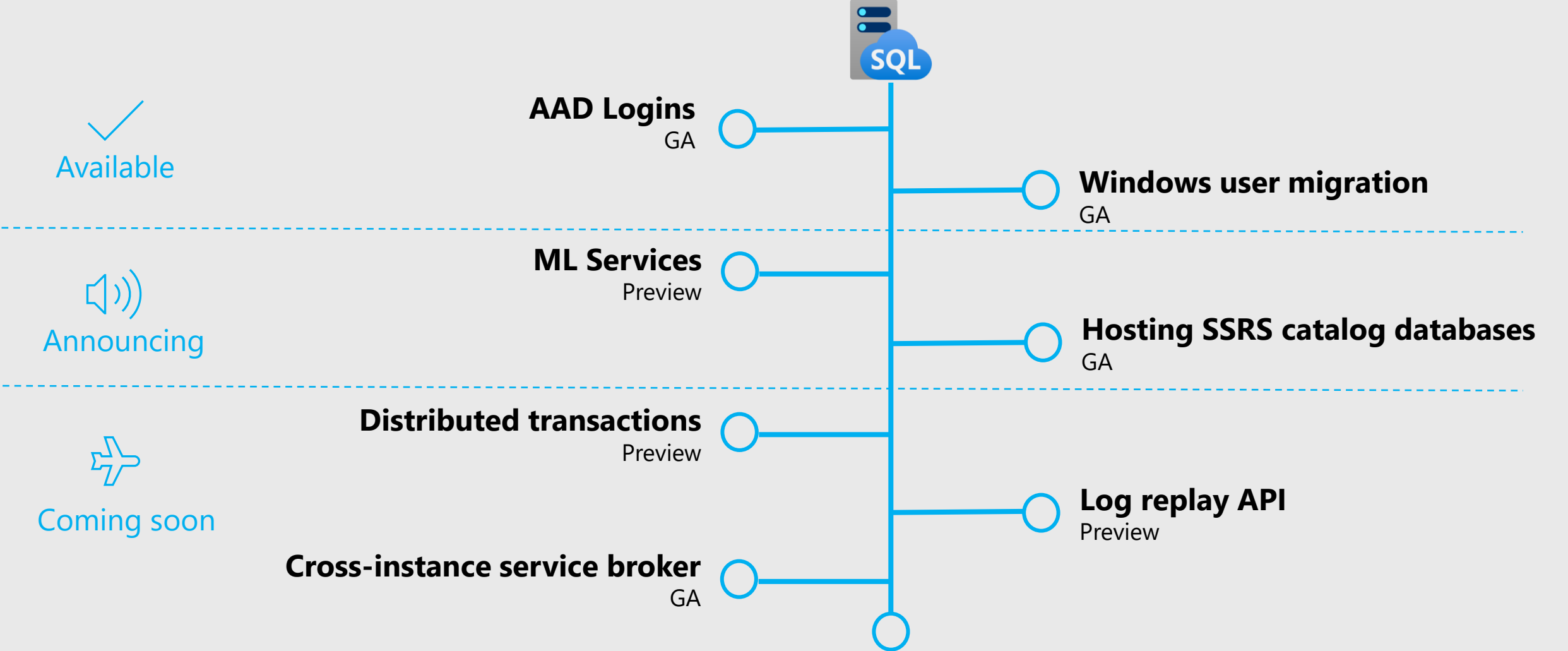
# How to connect to Managed Instance



**What's new and what's coming next**

# SQL MI New Features and Improvements

*SQL Server compatibility and seamless migration*



✓  
Available

🔊  
Announcing

✈️  
Coming soon



# Distributed transactions across SQL MIs

COMING SOON

Managed instances can reside in the **same or different regions**

Cross-instance collaboration secured with **Server Trust Group** entity

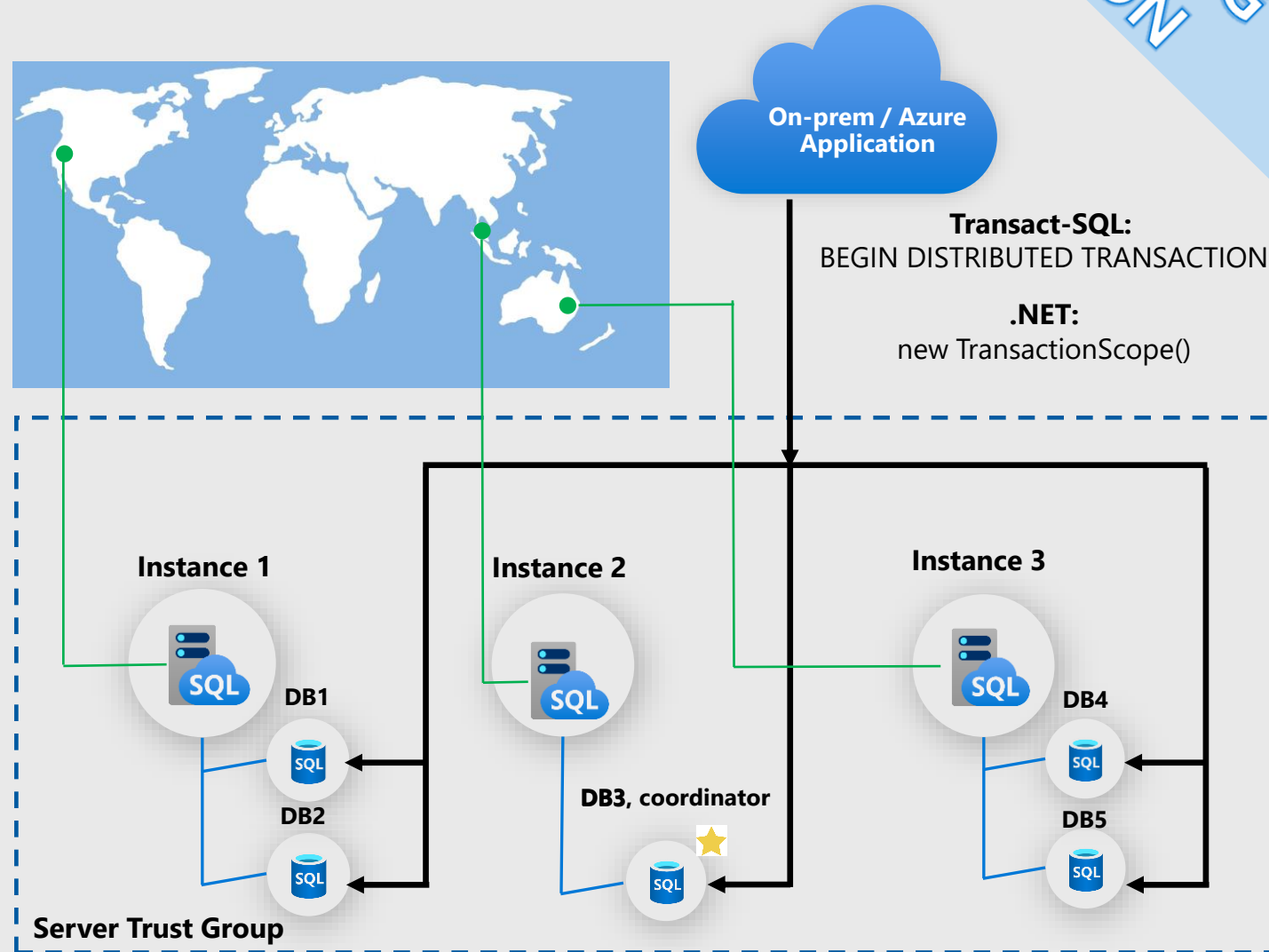
Enabler for app architectures with **vertically or horizontally partitioned** data

Unlocks **migrations and modern app development** scenarios

Preview limitations:

**Homogeneous** participants (SQL MI only)

**.NET** as the only app layer supported (in addition to **Transact-SQL**)



# SQL MI New Features and Improvements

*Business continuity and disaster recovery*

✓  
Available

**Accelerated Database Recovery**  
GA

**Geo-restore**  
GA



**PITR for deleted databases**  
GA

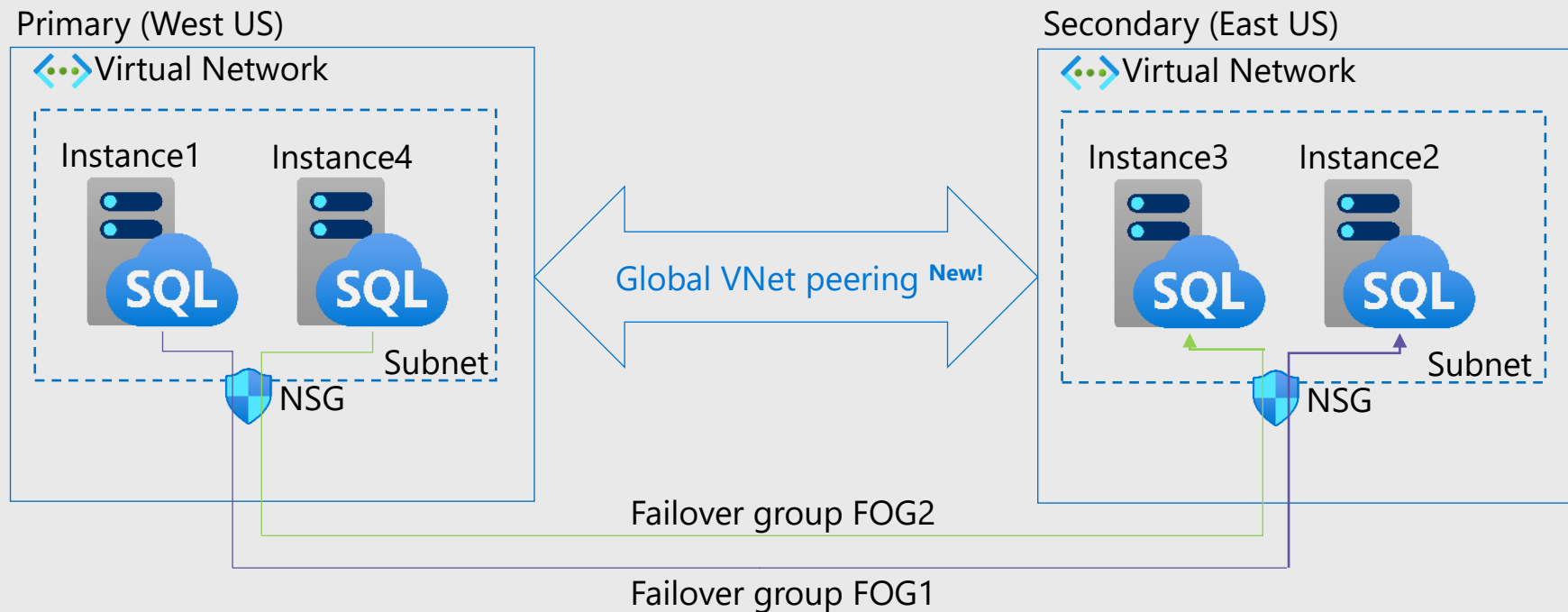
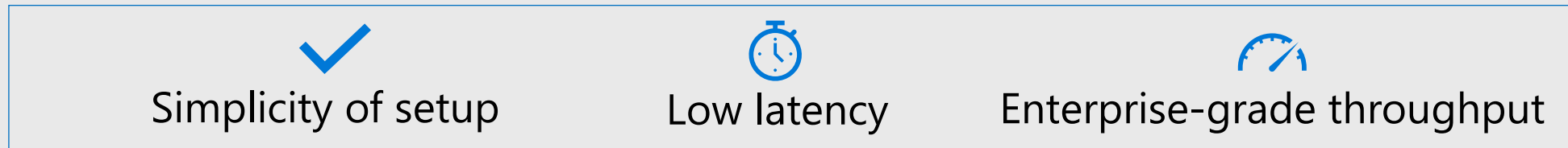
**Cross-instance PITR**  
GA

🔊  
Announcing

**Global VNet peering**  
GA



# Global VNet Peering support



\* Supported in newly created subnets only

# SQL MI New Features and Improvements

*Security and compliance*

✓  
Available

**TLS 1.2 enforcement**  
GA

**Long-term backup retention**  
Preview

**Backup redundancy options (LRS/ZRS/GRS)**  
GA

**Private link**  
Preview



**Service-aided subnet configuration**  
GA

**Service endpoints**  
GA

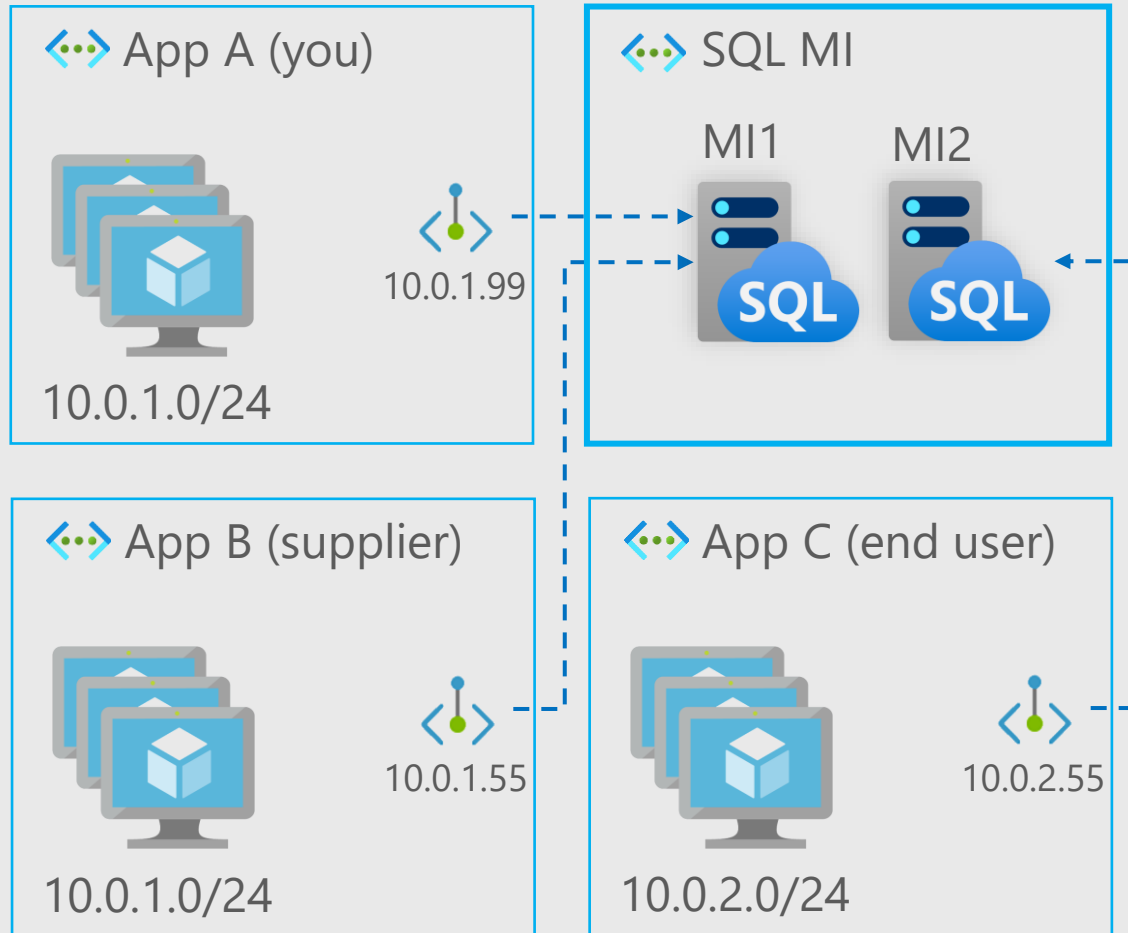
**Service endpoint policies for storage**  
GA

🔊  
Announcing

✈️  
Coming soon

# Private Link

COMING  
SOON



- Provides fixed private IP address of MI
- Enables instance-level traffic control
- Enables distributed network architectures
- Works across regions, subscriptions and tenants

# SQL MI New Features and Improvements

*Performance, scalability and cost optimization*

✓  
Available

**Improved backup compression**

GA

**Backup retention period < 7 days**

GA

🔊  
Announcing

**Performance improvements**

GA



# SQL MI Performance Improvements (Perf v2)

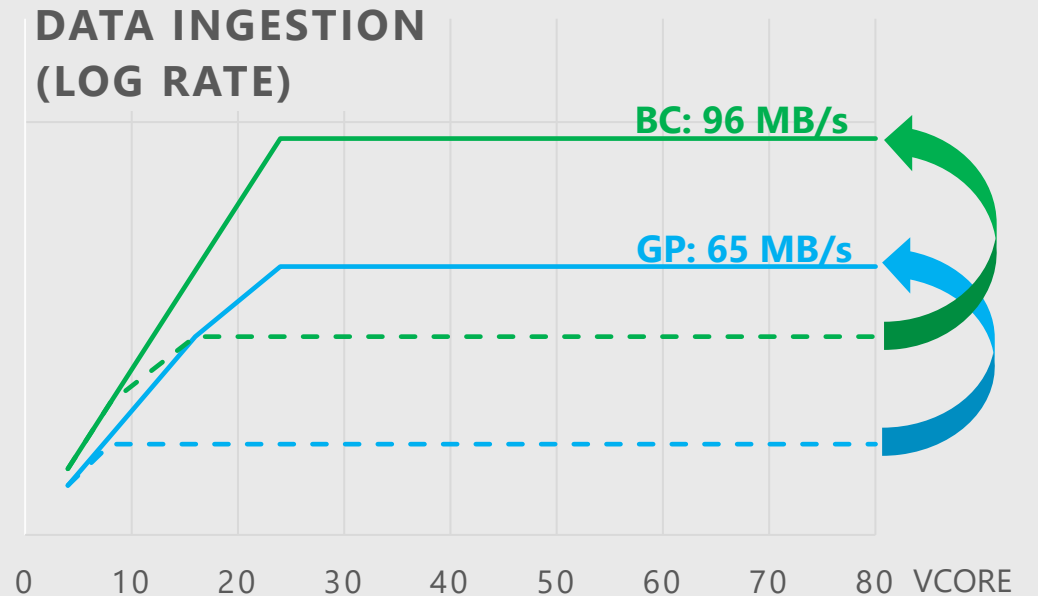
## Improved log rate for SQL MI General Purpose (GP)

- Per-instance limit: 3MB/s per vCore (unchanged)
- Per-instance max: **120 MB/s** (up from 22 MB/s)
- Per-DB limit (new):

Log file size	Per-DB limit
<= 128 GB	22 MB/s
<= 512 GB	30 MB/s
<= 1 TB	50 MB/s
<= 2 TB	65 MB/s

## Improved log rate for SQL MI Business Critical (BC)

- Per-instance limit: 4MB/s per vCore (unchanged)
- Per-instance max of **96 MB/s** (up from 48 MB/s)
- Increased IOPS from 2.5k to **4k IOPS**



## Test Results (SQL MI GP):

- TPC-C – 2x-3x transaction throughput
- TPC-H – up to 23% lower execution time
- Scans – up to 2x throughput
- Data Ingestion – 2x-3x data ingestion rate

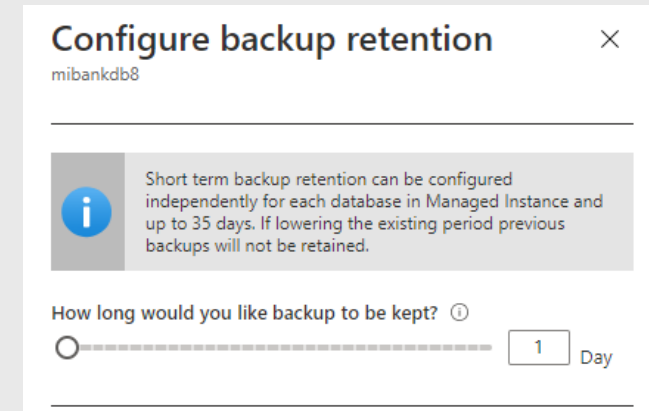
# Demo

SQL MI Index Rebuild before and after



# Automatic backups cost optimization

- Fine-tuning of PITR backup retention period:
  - **1**-35 days for active databases
  - **0**-35 days for deleted databases
- Up to 30% better compression of backups
- Less expensive backup storage options through configurable redundancy



## Backup

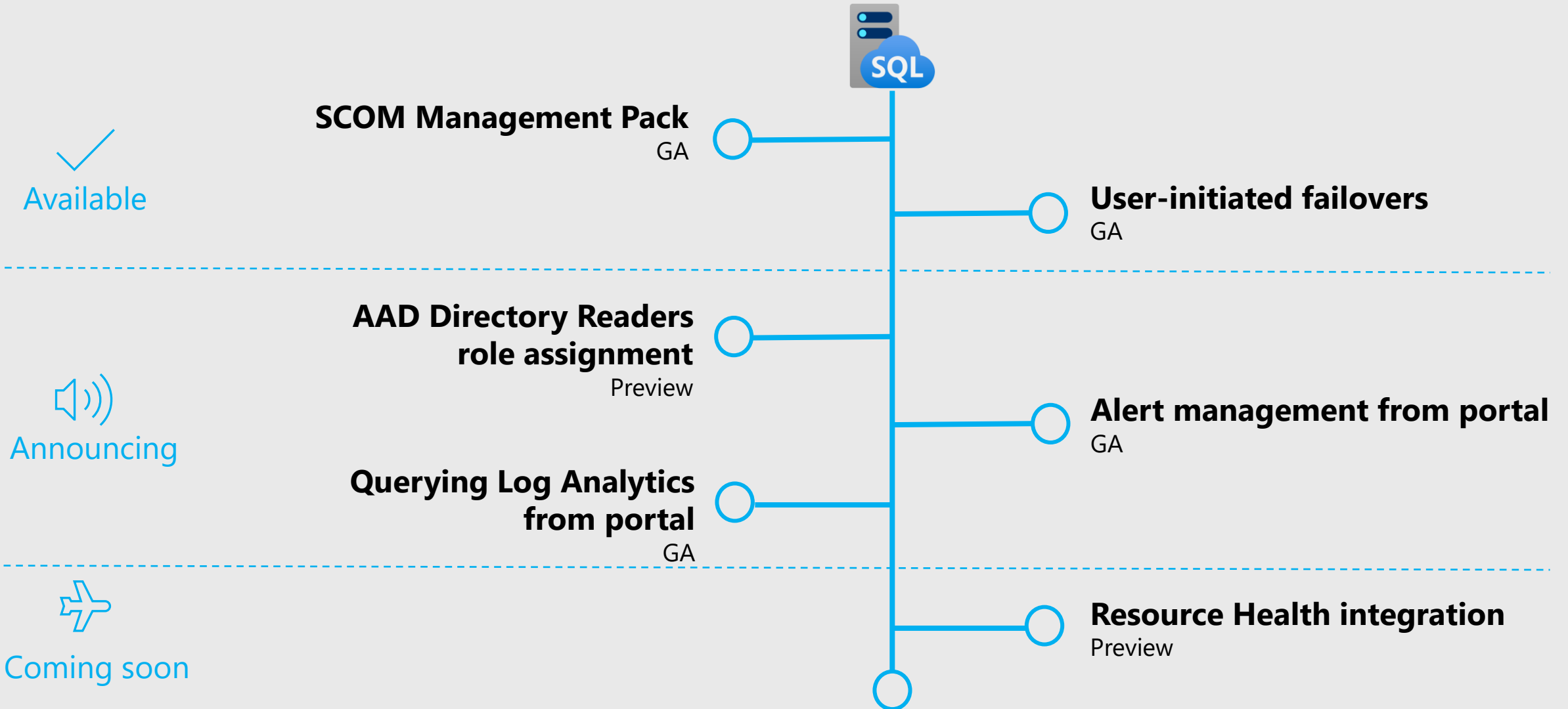
Backup storage, up to the same amount of 256 GB as data storage, is provided free of charge. Consuming backup storage above this amount is billed per usage. [Learn more](#) ↗

### Backup storage redundancy ⓘ

- Geo-redundant storage (RA-GRS)
- Zone-redundant storage (ZRS) - Preview
- Locally-redundant storage (LRS) - Preview


# SQL MI New Features and Improvements

*Monitoring and manageability*



# AAD Directory Readers role assignment (preview)

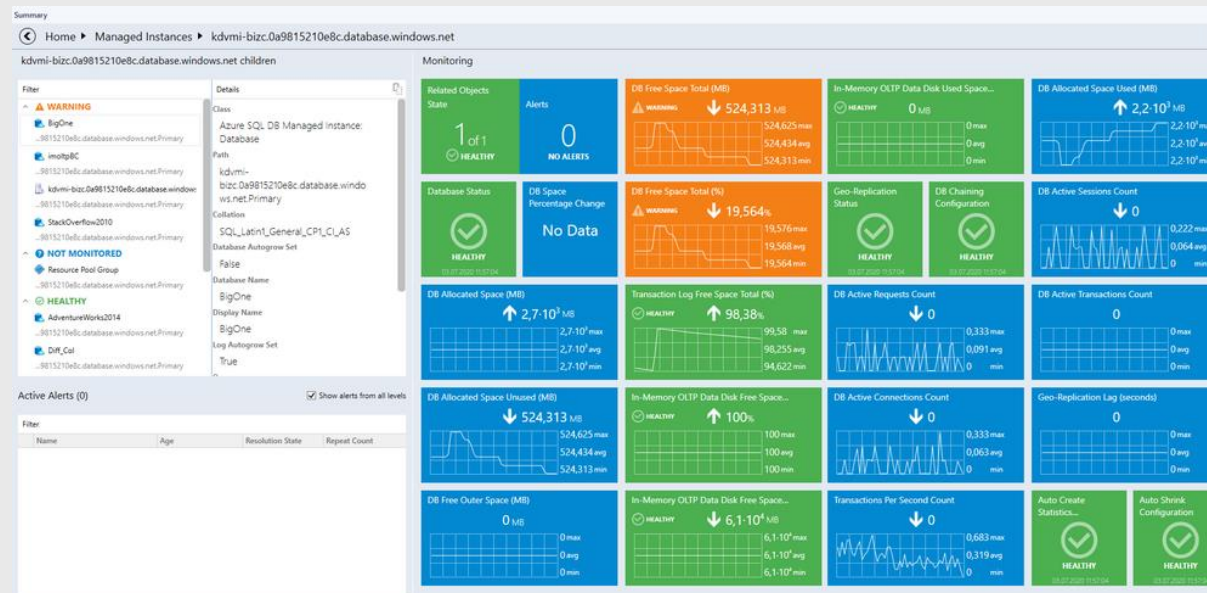
No more Global Admin's or Privileged Role Admin's action needed per each instance:

 Managed Instance needs permissions to access Azure Active Directory. [Click here to grant "Read" permissions to your Managed Instance.](#) →

1. Global Admin or Privileged Role Admin (once per Azure AD tenant):
  - Create Azure AD group and assign "Directory Readers" role to this group
  - Assign group owners to the group – any Azure AD users without specific roles
2. Group owners then can add managed identity of an instance to the group

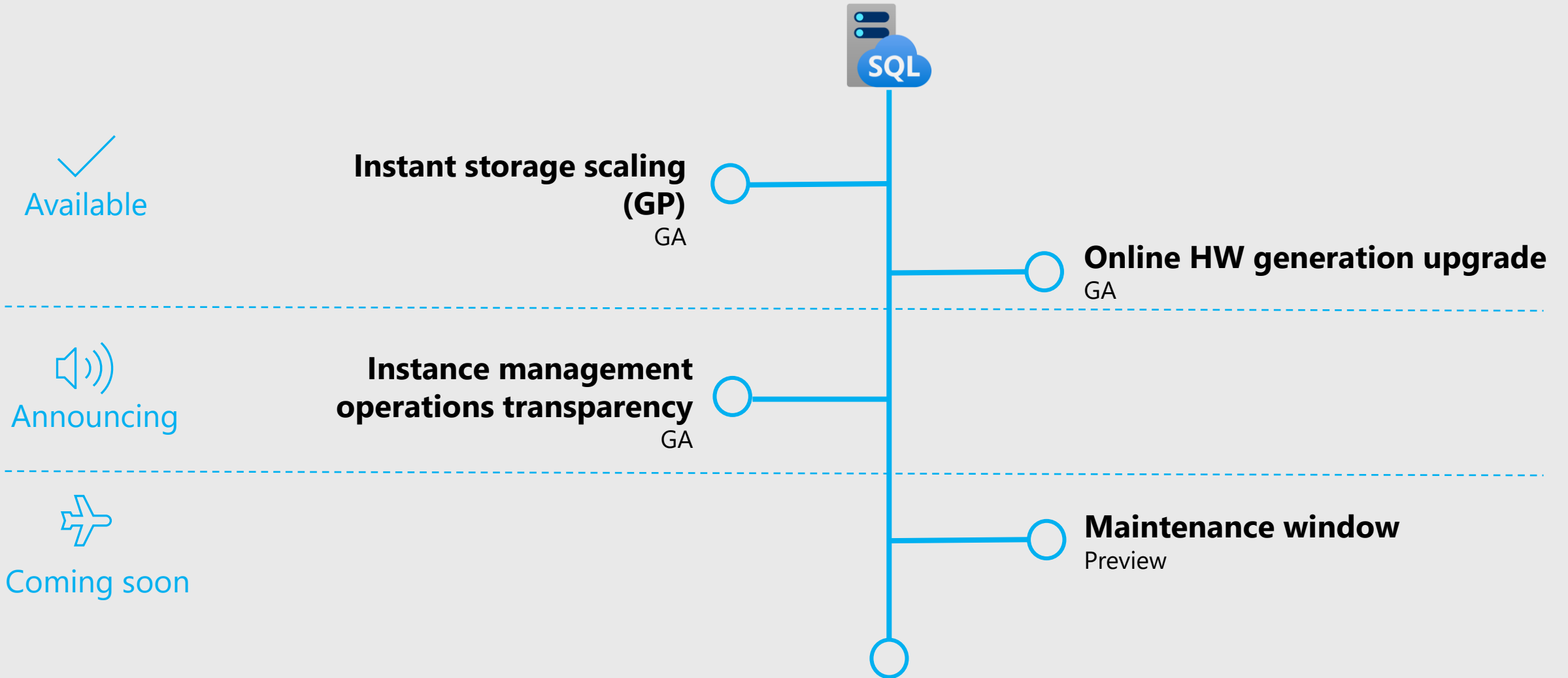
# Monitoring hybrid environment using SCOM

- SCOM Management Pack for MI (GA)
- Ability to monitor hybrid environments: SQL Server + SQL DB/MI
- The most comprehensive monitoring solution for MI based on SQL Server MP
  - Automatic discovery of Azure SQL resources to monitor
  - Updated dashboards
  - Monitoring of MI specific features: Failover Groups



# SQL MI New Features and Improvements





*Service deployment and patching*



# Enhanced instance management experience


## CRUD API improved - [link](#)

- New API version (2020-02-02) introduced
- MI visible from the start of provisioning
- New provisioningState property
- Full tooling support (Portal, PowerShell, Azure CLI)

<input type="checkbox"/>	 miwestus	West US	Ready
<input type="checkbox"/>	 mixeddnszonetest7	eastus2euap	Updating
<input type="checkbox"/>	 mixedxx	eastus2euap	Creating
<input type="checkbox"/>	 mlazic-test-managed-instance-3	West Europe	CreationFailed

## OPERATIONS API introduced - [link](#)

- For retrieving status of create/update operations
- Response contains operation parameters (old -> new)
- Response contains operation steps (current step, total steps, step details)
- Provides capability for canceling operation
- Full tooling support (Portal, PowerShell, Azure CLI)

 Managed Instance create operation in progress. Click here to learn about next steps. →


**Your Managed Instance is in creation process**

Managed instance creation is long running management operation. For more details on management operations visit [official documentation page](#)

<b>Step 1/3</b> Request validation Completed	<b>Step 2/3</b> Virtual Cluster resize/creation In Progress	<b>Step 3/3</b> New SQL Instance Startup Not Started
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**Notifications (1)** Managed Instance features (1)

All Alerts (0) Info (1) Recommendations (0)

 **You have 1 ongoing operation**

This managed instance has some ongoing or recent operations. Click here to view them.

# Resources

**Try the Azure SQL Workshop**

[aka.ms/sqlworkshops](https://aka.ms/sqlworkshops)

**Check Azure SQL Managed Instance documentation**

[aka.ms/azuresqldocs](https://aka.ms/azuresqldocs)

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