

# Azure SQL Managed Instance

Global Azure Bootcamp

Suranga Fernando

Data Platform Solution Architect

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# Agenda

## Overview

Database Landscape in Azure

## SQL Managed Instance

Introduction to SQL Managed Instance

Performance Tiers

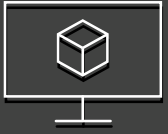
## Migration Options

Data Migration Assistant/Data Migration Service

Backup/Restore

# Microsoft Azure Database Services

Just a subset.....



## SQL Server on Azure Virtual Machines

SQL Server installed and hosted in the cloud



## Azure SQL Database

Intelligent relational cloud database service



## Azure Cosmos DB

Globally distributed, multi-model database service



## Azure SQL Data Warehouse

Elastic, enterprise-class data warehouse as a service



## Azure Database for MySQL

Managed MySQL database service for app devs



## Azure Database for PostgreSQL

Managed PostgreSQL database service for app devs

# Azure SQL Managed Instance

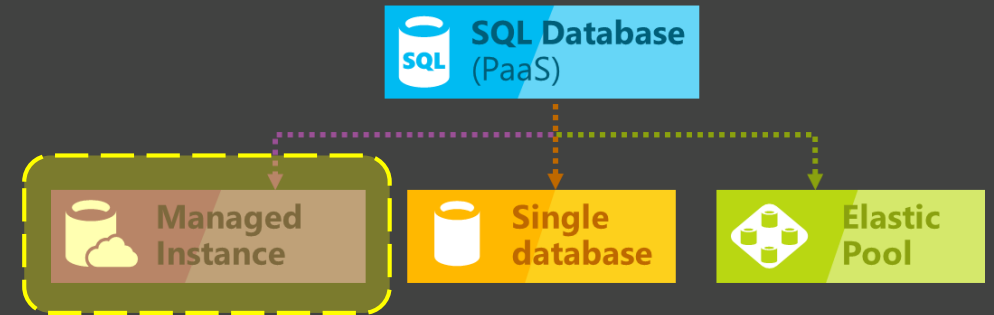
Fully managed Instance scoped SQL Server in Azure

Close compatibility with on premise SQL Server including: Logins, SQL Agent, Replication, Backups, SQL Audit, cross database joins, resource governor, database mail, SQLCLR, service broker, linked servers.....

Built in HA/DR, PITR, Threat detection, patching, SQL Analytics

Scale up/down on demand

Injected into your Virtual Network with support for NSGs



Simplify SQL Server migrations to Azure

# Benefits of Platform Services

Your work so far	How PaaS helps
Hardware purchasing and management	<b>Built-in</b> scale on-demand
Protect data with backups (with health checks and retention)	<b>Built-in</b> point-in-time restore
High availability implementation	<b>Built-in</b> 99.99% SLA and auto-failover
Disaster recovery implementation	<b>Built-in</b> geo-redundancy and geo-replication
Ensure compliance with standards on your own	<b>Built-in</b> easy to use features
Secure your data from malicious users and mistakes	<b>Built-in</b> easy to use features
Role out updates and upgrades	<b>Built-in</b> updates and upgrades
Monitor, troubleshoot, and manage at scale	<b>Built-in</b> easy to use features
Tune and maintain for predictable performance	<b>Built-in</b> easy to use features

**We take care of your database chores**

# Demo

Connecting to SQL Managed Instance

# Performance Tiers



## Two hardware generations to choose from:

Gen 5	Gen 4
5.1GB RAM per vCore Up to 80 vCores (hyper-threaded)	7GB RAM per vCore Up to 24 vCores (physical)

## Two performance tiers to choose from:

General Purpose	Business Critical
For general production workloads Storage is remote premium Azure storage (SSD) 8TB Maximum instance size	For workloads with higher performance/HA requirements Storage is local super-fast SSD 1TB - 4TB Maximum instance size (dependent of hardware generation and vCores)



# Architecture – General Purpose (GP)

Architecture for GP separates storage and compute.

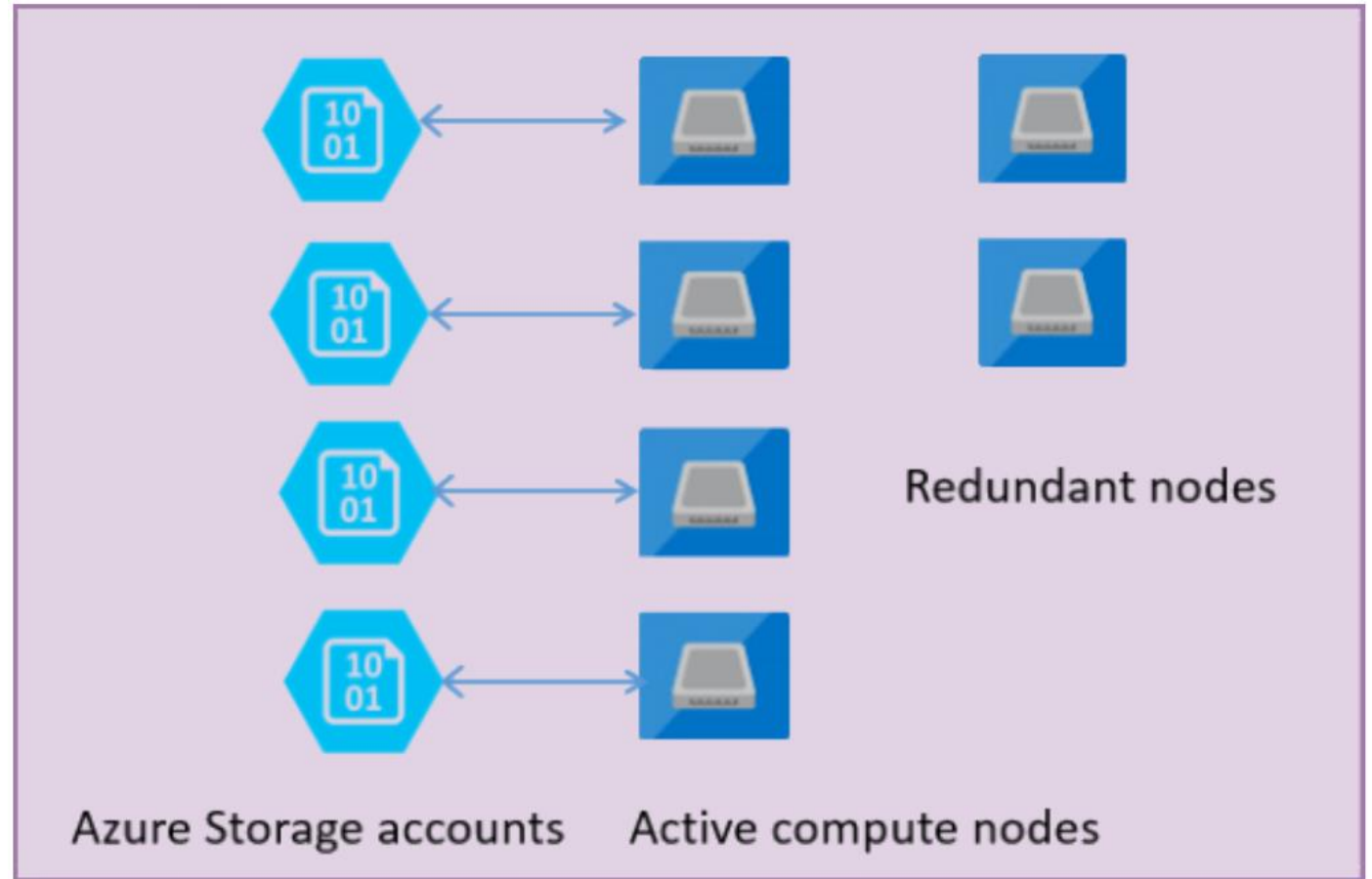
Stateless compute nodes operated by Azure Service Fabric

Redundant compute nodes ensure rapid failover times

Uses remote Azure Premium Storage (Max 8TB)

Storage latency ~5-10ms

99.99% Availability Service Level Agreement



# Architecture – Business Critical (BC)

Architecture for BC collocates storage and compute.

High availability is provided by replicating storage and compute

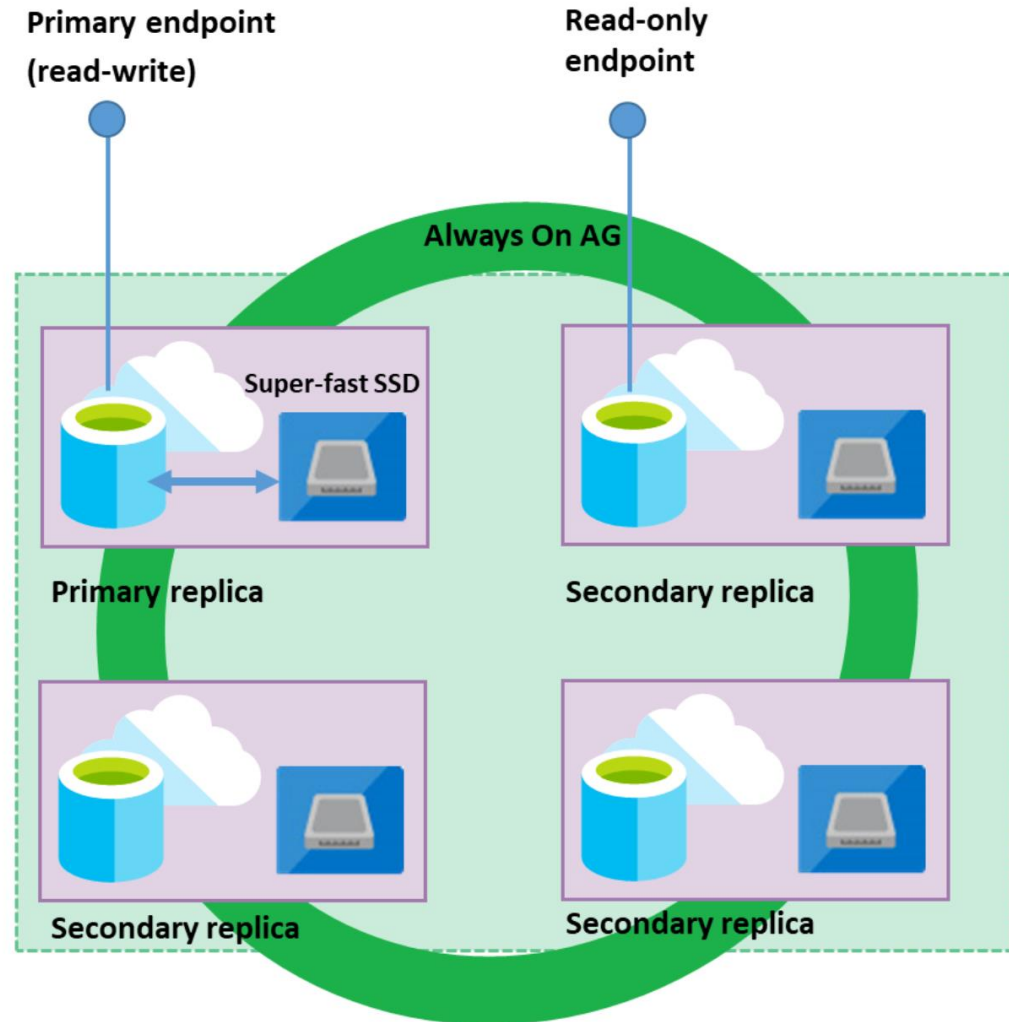
System utilizes SQL Always On Availability groups (1 primary + 3 replicas)

Provides a read-only endpoint

In Memory OLTP

Storage is local solid-state disk (Max 4TB)

99.99% Availability Service Level Agreement



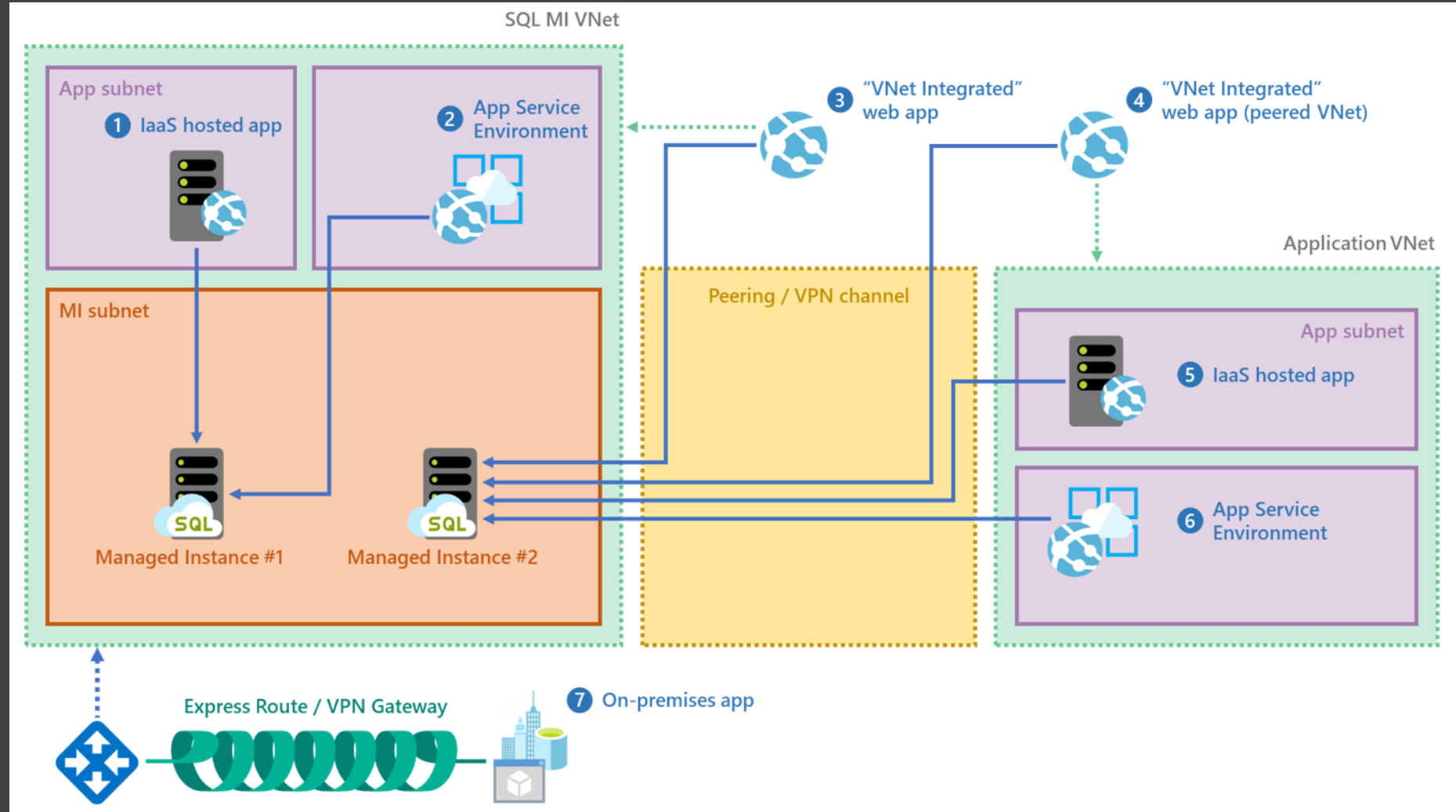
# Managed Instance – Networking & Connectivity

Isolated to a single customer

Optional public endpoint now available (preview)

Multiple Instances can exist within the same subnet

Network policy allows Microsoft Management traffic through securely



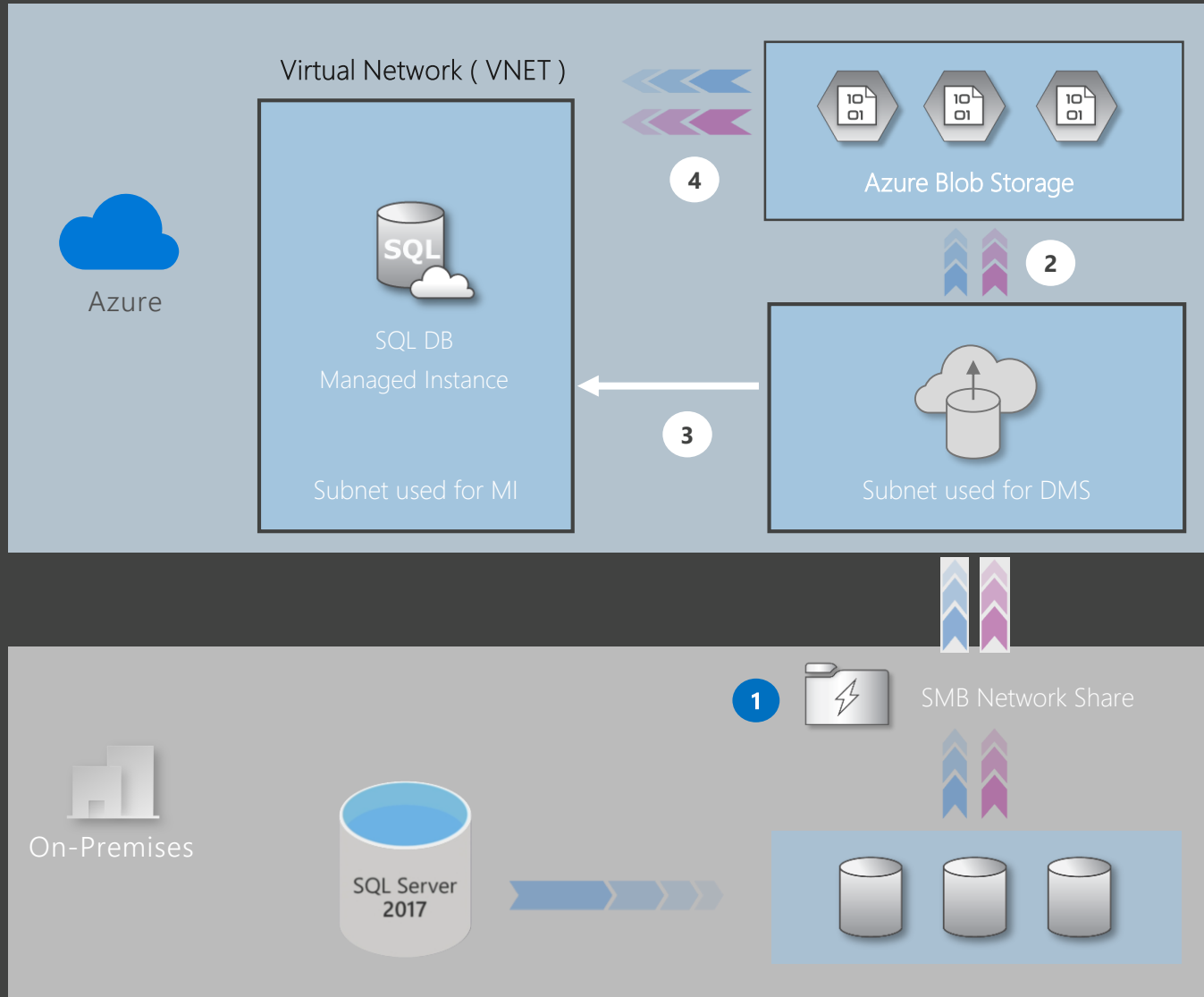
# Demo

## Provisioning SQL Managed Instance

# Migration Options



# Online migration – available in DMS only

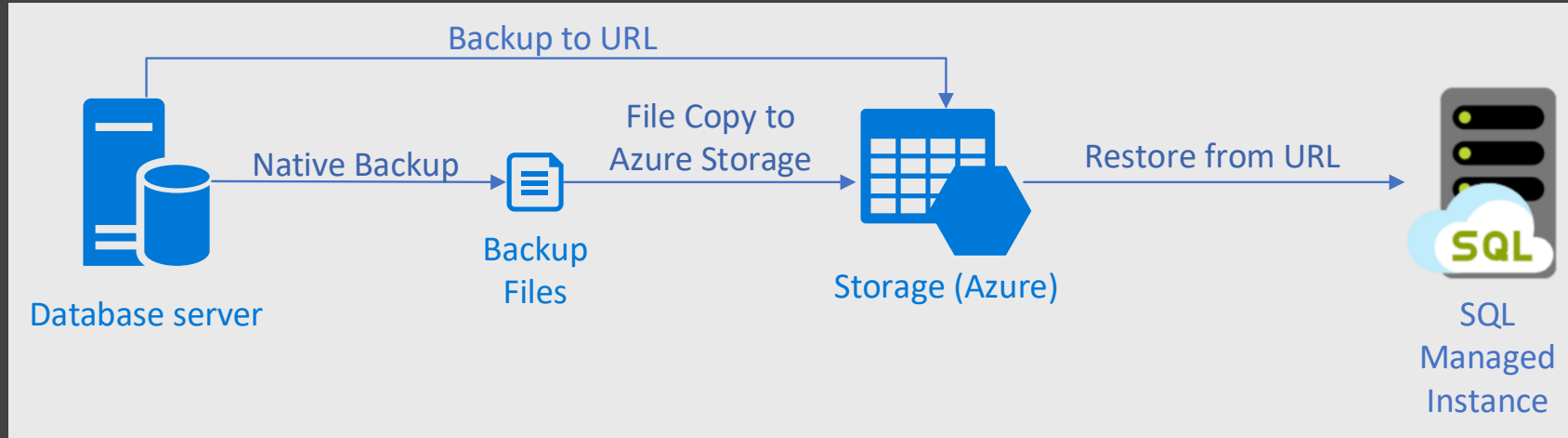


- 1 Provide existing backups in network share
- 2 DMS upload backup files to Azure storage
- 3 DMS initiate the migration to Azure SQL MI
- 4 Full backup restored and Transaction log backups continuously applied until cutover

Provide Tail-Log backup, initiate cutover in DMS and change the application connection strings

# Managed Instance - Migration Options

## Native Backup/Restore



- Can stripe backup to URL for great performance
- Backup/Restore commands use standard T-SQL

# Demo

## Migration Scenarios



# Advice and best practice

Review the [documentation](#)

Assess compatibility with [Data Migration Assistant](#) (DMA) at scale

Design networking topology upfront

Get networking and security teams involved

Review [regional availability](#) and default [subscription-level quotas](#), and resource limits

Configure Azure Active Directory Auth if required – you may need to find AAD expertise for complex scenarios

Test YOUR workload



# Resources

## Documentation

- [Managed Instance landing page](#), [What is Managed Instance](#), [T-SQL specifics](#)
- [Configure VNets for SQL MI](#), [Connect apps to SQL MI](#)
- [Availability, resource limits, quotas](#)
- [Azure SQL Analytics](#)
- [Database Migration Service](#), [Database Migration Assistant](#)

## Blogs

- [Cross-instance point-in time restore in SQL MI](#)
- [Sending emails in SQL MI](#)
- [Azure SQL DB Managed Instance – sp\\_readmierrorlog](#)
- [CPU and Memory Allocation on Azure SQL Database Managed Instance](#)
- [Storage performance on Azure SQL DB Managed Instance \(General Purpose\)](#)
- [Real-time performance monitoring for Azure SQL Database Managed Instance](#)

# SQL MI - shared responsibility model

What is service doing for you	What is under your control
Hardware allocation and health management, Service deployment	Tier selection, instance sizing Initiate deployment or update service tier
Patching, updating (OS, Azure platform, SQL)	Database schema deployment or database restore, Compatibility level selection
Automatic backups (full/diff/log)	User-initiated full backups PITR and geo-restore for recovery purposes
Certificate management (TDE, SSL)	Client driver updates
Default network setup	Customized network setup including on-prem to Azure connectivity (Express Route for example)
High availability configuration (99.99 SLA)	
Geo-replication: FG & database sync implementation	Geo-replication: cross-site connectivity and secondary instance configuration
Protection from data corruption and data loss	Fixing application errors and testing
Setting up health & performance telemetry streams Proactive health monitoring and alerting	Monitoring with 3 <sup>rd</sup> party tools your own scripts
Automatic tuning, adaptive QP	Schema optimization, index maintenance
	Dev/test sync with production
	AD to AAD sync and AAD auth configuration