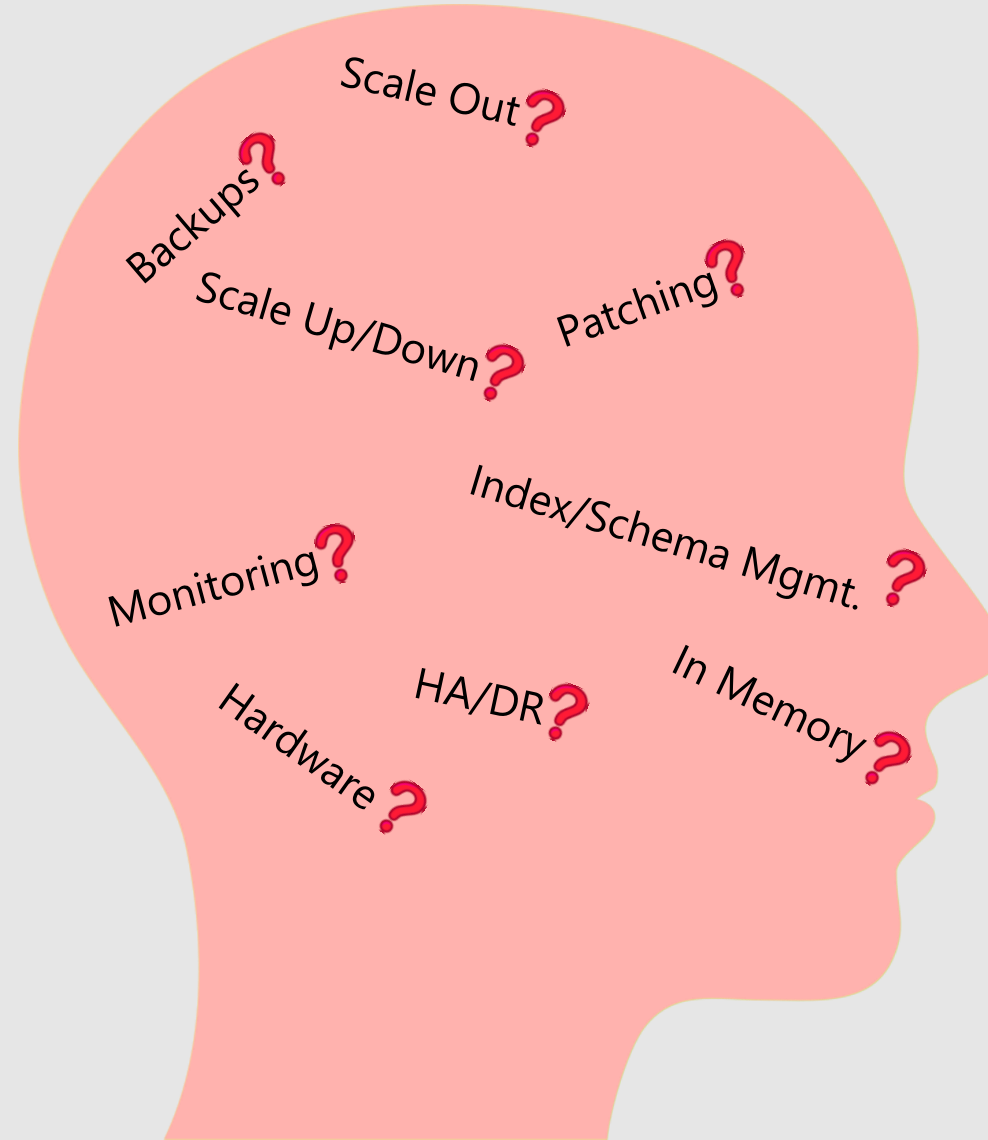


Move and manage your SQL Databases to Azure

Itai Binyamin & David Markovitz

Cloud Solution Architect's





Scale Out?

Backups?

Scale Up/Down?

Patching?

Index/Schema Mgmt.?

Monitoring?

In Memory?

HA/DR?

Hardware?

I just want to build
software...



I just want to build software



"I want my results faster"

Performance issues

- Missing/rarely used indexes
- Regressions in SQL plans
- Disruptive events



"I want my data secure"

Compliance

- GDPR
- PCI
- HIPAA
- FedRAMP

Common Threats

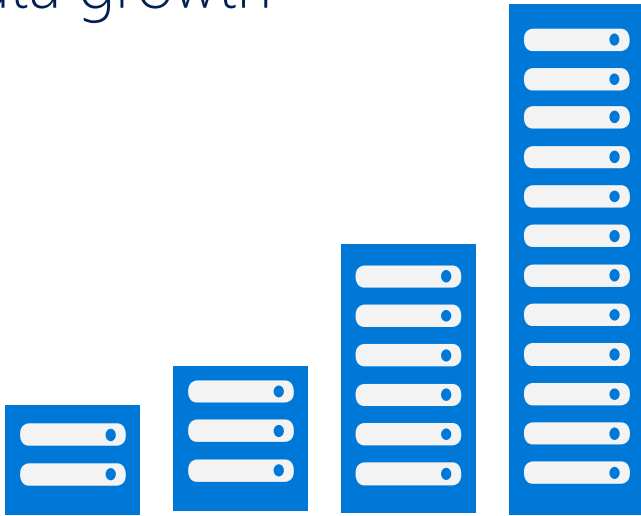
- SQL injection
- Password cracking
- Credential theft
- Privilege Misuse

New opportunities in a changing data landscape



Massive
data growth

50ZB



Build data
into all your apps

Widely available
unstructured data



10100
10100
10



Deliver powerful insights
over big data

Analytics driving
digital transformation



Modernize your apps
with built-in analytics

New opportunities in a changing data landscape



2011



2018

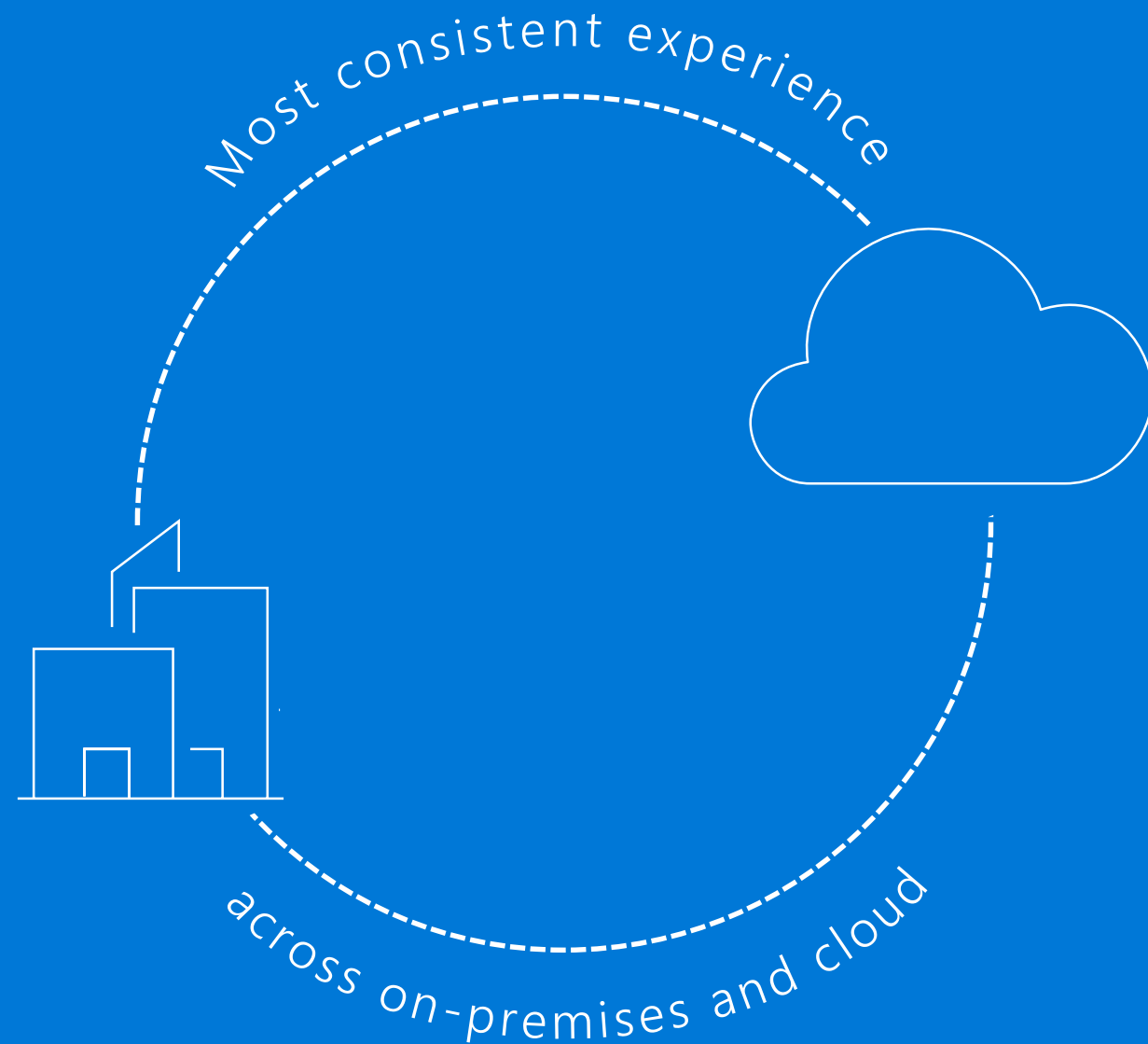


So what to do ??



Microsoft Data Platform

Consistent data platform for
powerful hybrid scenarios



Power your data estate anywhere

DATA SOURCES

Structured

OLTP

MOBILE

ERP

LOB

Unstructured

Graph

Social

IoT

Media

DATA MANAGEMENT

	Operational data	ON-PREM	CLOUD
Data virtualization	SQL Server		Azure SQL Database Azure Cosmos DB
	Data warehousing		
	SQL Server Data Warehouse		Azure SQL Data Warehouse
	Big data processing		
	Apache Hadoop		HDInsight Data Bricks Azure Data Lake

DATA INSIGHTS

Business intelligence

Power BI

Power BI Report Server and Mobile BI

Advanced Analytics & AI

SQL Server Analysis Services and R built-in

Azure Machine Learning

Azure Stream Analytics

Azure Cognitive Services

SECURITY

More certifications than any other cloud provider








ISO 27001 ISO AICPA SOC CSA FedRAMP NIST

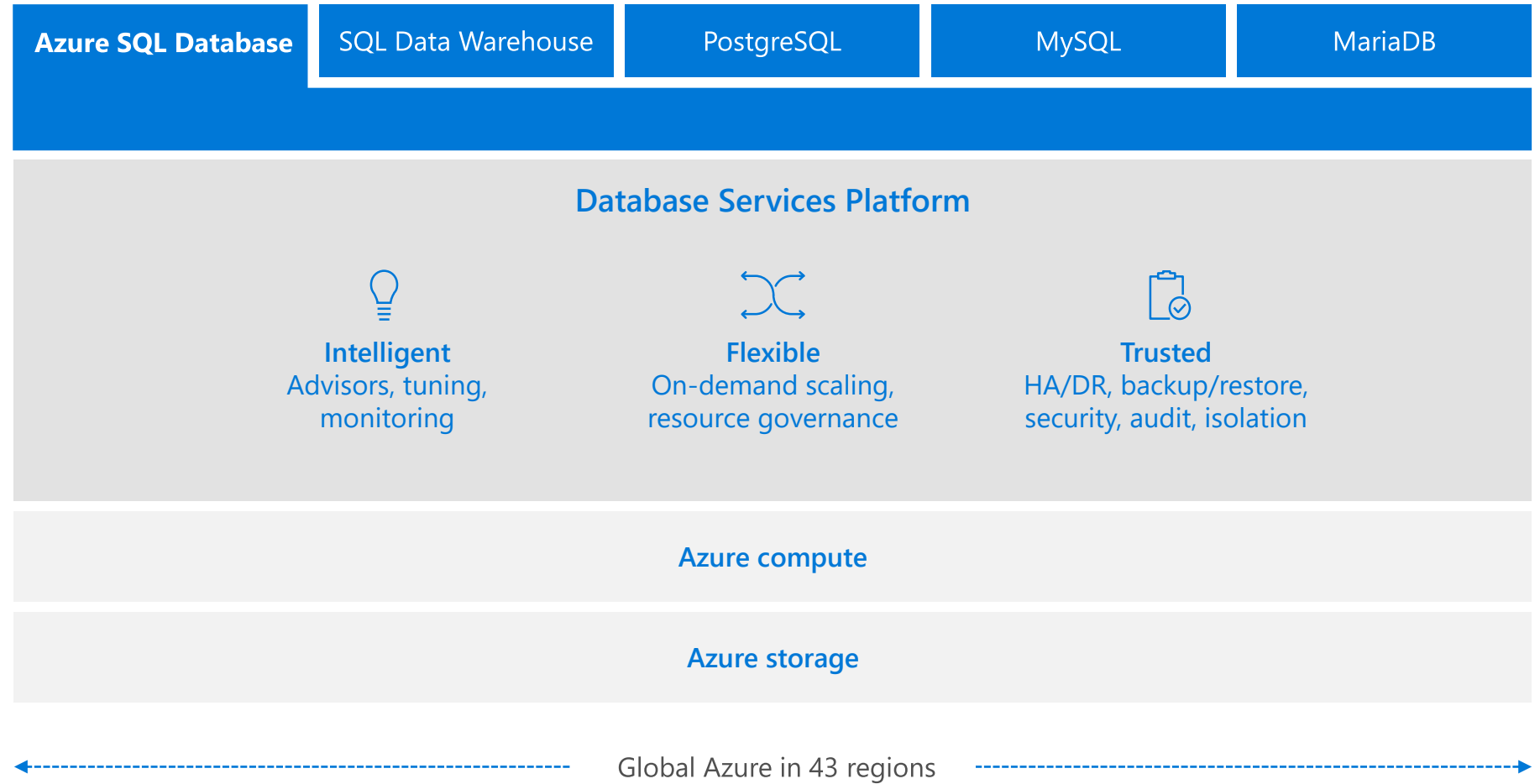
FLEXIBILITY

Any language, any platform, anywhere

Windows Linux Container node.js Python .NET JAVA Azure 3rd

Azure Relational Database Platform

-  Power BI
-  Azure App Services
-  Azure Data Factory
-  Azure Analysis Services
-  Azure Machine Learning
-  Azure Cognitive Services
-  Azure Bot Service



AZURE SQL DATABASE

Put your database on Autopilot; focus on your business

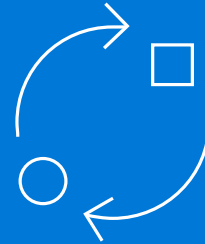
Intelligent DBaaS



Privacy and Trust



Seamless and compatible



Competitive TCO



AZURE SQL DATABASE



Intelligent DBaaS



Privacy and Trust



Seamless and compatible



Competitive TCO

OPERATIONAL ANALYTICS

Columnstore
Hekaton (in-memory OLTP)

PREDICTABLE PERFORMANCE

Query Store
Index Optimization

ACTIVITY MONITORING

Engine Audit

ACCESS CONTROL

SQL Firewall
RLS, Dynamic data masking

DATA PROTECTION

Encrypt in motion (TLS)
TDE
Always Encrypted (equality)

HA-DR BUILT-IN

99.99% SLA
Geo-restore

BACKUP AND RESTORE

Backup with health check
35 days PITR

DISTRIBUTED APPLICATION

Change Tracking

BIZ MODEL & SKUS

DTU/eDTU
<=1TB (premium & standard)

(2017) AZURE SQL DATABASE



Intelligent DBaaS



Privacy and Trust



Seamless and compatible



Competitive TCO

OPERATIONAL ANALYTICS

Columnstore
Hekaton (in-memory
OLTP)

PREDICTABLE PERFORMANCE

Query Store
Index Optimization
AUTOMATIC TUNING
AUTO QUERY PLAN
CORRECTION
PERFORMANCE INSIGHT IN
OMS
ADAPTIVE QUERY PROCESSING

SQL GRAPH

ADVANCED ANALYTICS

NATIVE PREDICT
R SERVICES

ACTIVITY MONITORING

Engine Audit
THREAT DETECTION
CENTRALIZED DASHBOARD
OMS

ACCESS CONTROL

SQL Firewall
RLS, Dynamic data
masking
AAD AND MFA

DATA PROTECTION

Encrypt in motion (TLS)
Always Encrypted (equality)
TDE & BYK
SERVICE ENDPOINT
ALWAYS ENCRYPTED (SECURE
ENCLAVE)

DISCOVERY & ASSESSMENT

VULNERABILITY ASSESSMENT

HA-DR BUILT-IN

99.99% SLA
Geo-restore
ACTIVE GEO REPLICAS (4)
MULTI-AZ

BACKUP AND RESTORE

Backup with health check
35 days PITR
10 YEARS DATA RETENTION

DISTRIBUTED APPLICATION

Change Tracking
TRANSACTION REPLICATION
DATA SYNC
SSIS SERVICE

BIZ MODEL & SKUS

DTU/eDTU
<=1TB
BIGGER STD: S4-S12
SEPARATE COMPUTE AND
STORAGE
AZURE HYBRID BENEFIT

COST OPTIMIZATION

INTELLIGENT PAAS

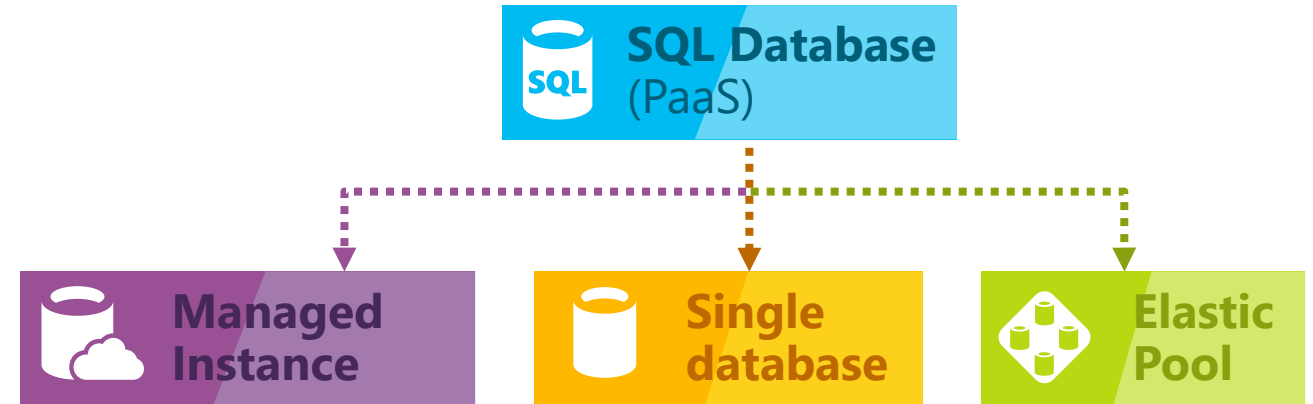
Introducing

Azure SQL DB Managed Instance



WHAT IS SQL DATABASE MANAGED INSTANCE?

New deployment option that enables friction-free migration for SQL workloads and modernization in a fully managed service



Full isolation and security

- Contained within your VNet
- Private IP addresses
- Express Route / VPN connectivity

Fully managed DBaaS

- Built on the same infrastructure as SQL DB
- All DBaaS features

SQL Server compatibility

- Fully-fledged SQL instance with nearly 100% compat with on-prem

New business model

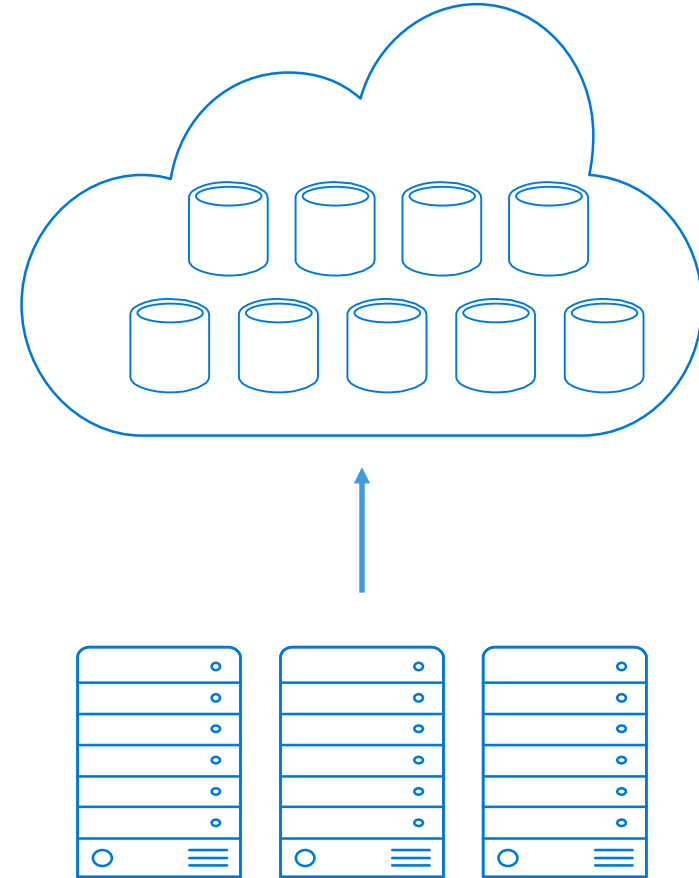
- Transparent
- Frictionless
- Competitive

SEAMLESS AND COMPATIBLE

Lift and shift your SQL Server data with Azure SQL Database Managed Instance

Easily migrate your data with near zero downtime with Azure Database Migration Service (DMS)

Tools for the journey to SQL Database



Save time with familiar SQL Server tools and resources

Eliminate app changes with full SQL Server programming surface

Use familiar SQL Server features in Managed Instances

- Native backup and restore

- Cross-database queries and transactions

- Security features including Transparent Data Encryption, SQL Audit, Always Encrypted and Dynamic Data Masking

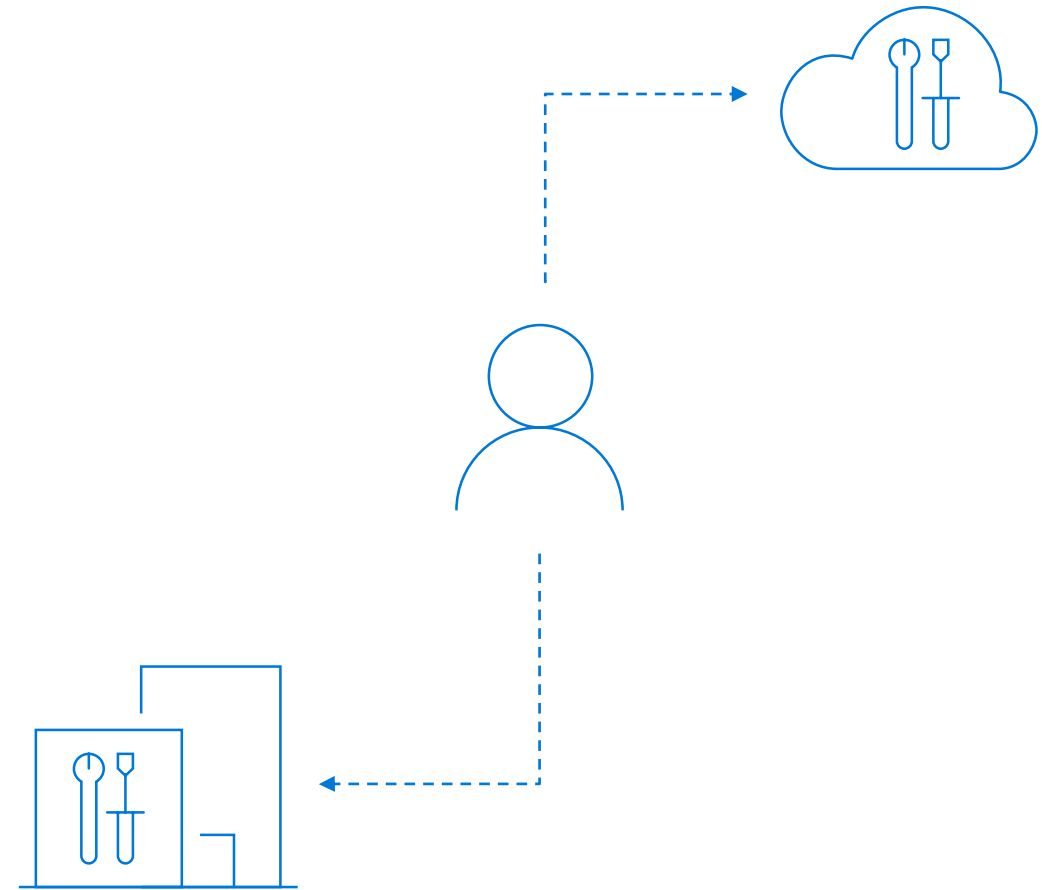
- SQL Agent, DBMail, for workload orchestration improved awareness

- Scenario enablers: Change Data Capture, Service Broker, Transactional Replication, and CLR

- DMVs, XEvents, and Query Store for troubleshooting



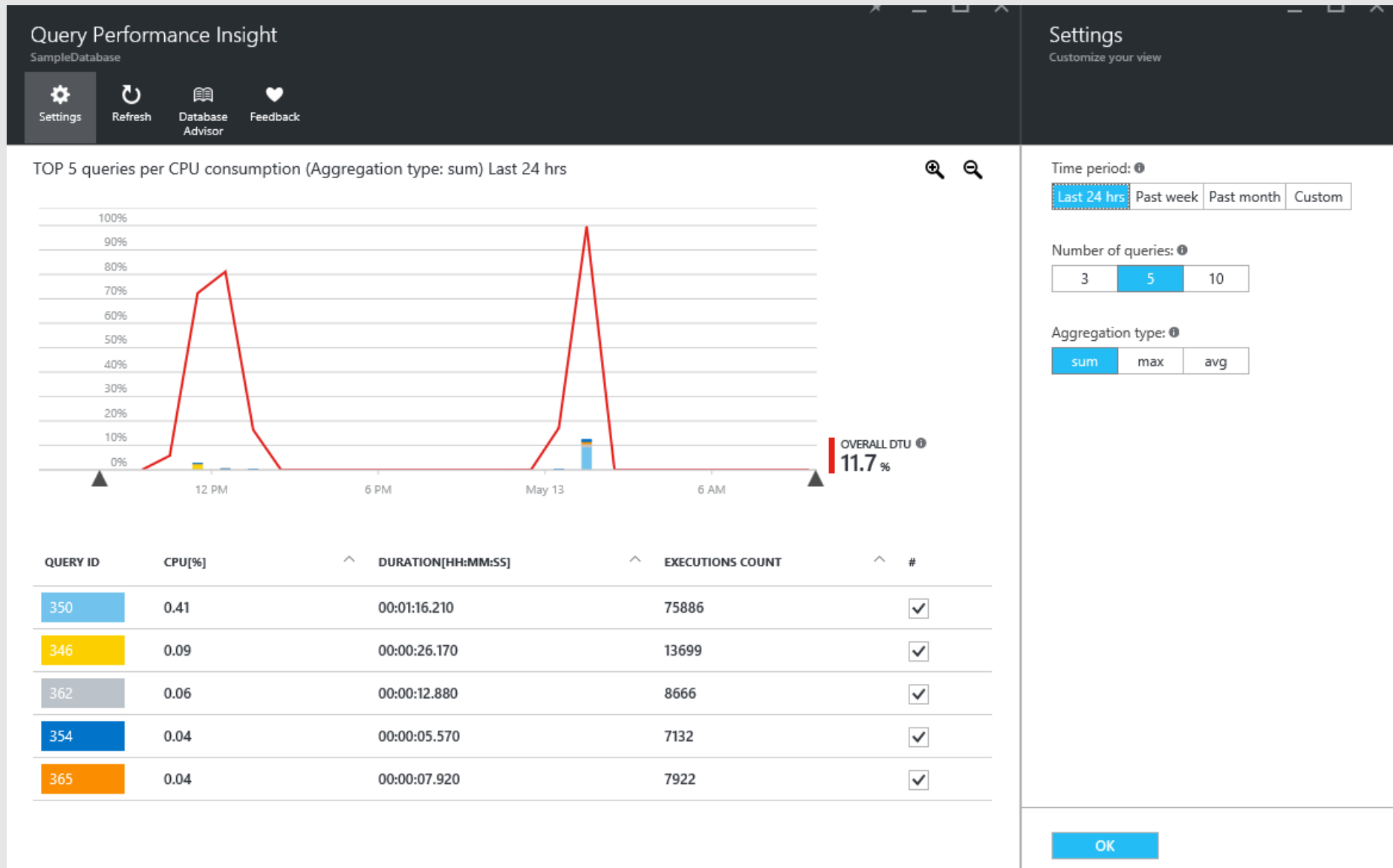
Full compatibility with SQL Server 2005+



Maximize app performance

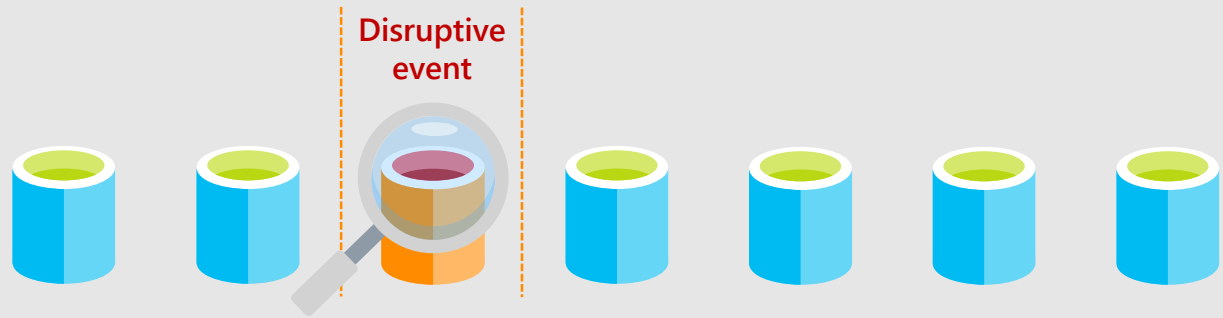


Query Performance Insight



Understand your database performance

Intelligent Insights



Queries:	0X9003HA4J	OK
	0X9002FGJR	Regressed query
	0X901119GI	OK
	0X900044RJ	OK

Continuous monitoring
Disruptive event detection
Root cause analysis

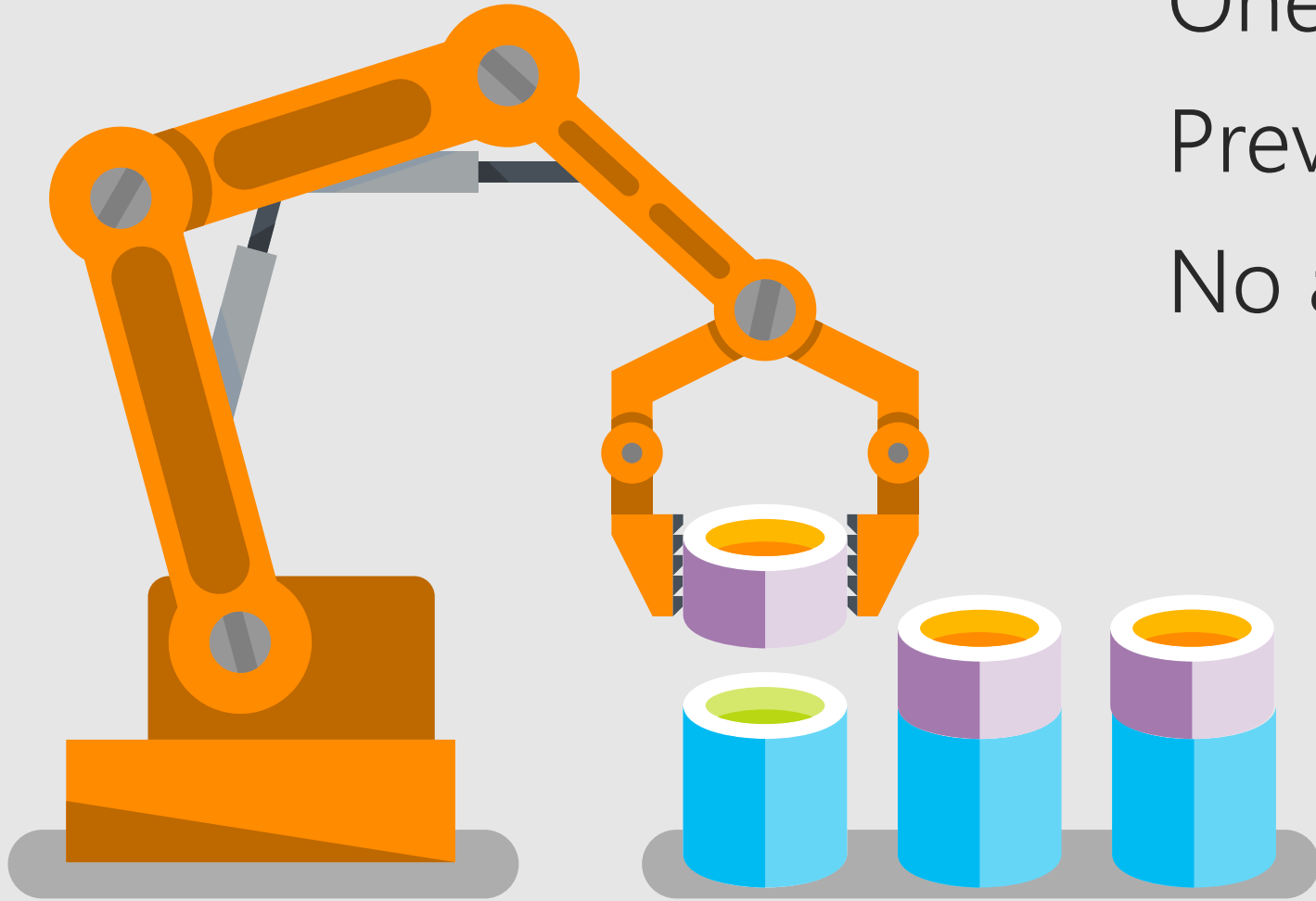
Available as diagnostic log

- Azure SQL Analytics solution
- Stream to Event Hub
- Archive to Storage

Root-cause: Hitting resource limits caused by new ad-hoc query 0X9001RTYU. Impacted query 0X9002FGJR started timing out. Consider stopping the ad-hoc query or increasing your pricing tier.

Continuously optimized by the platform

Automatic tuning



One-click to enable

Prevent and mitigate issues

No app changes needed

Tuning actions

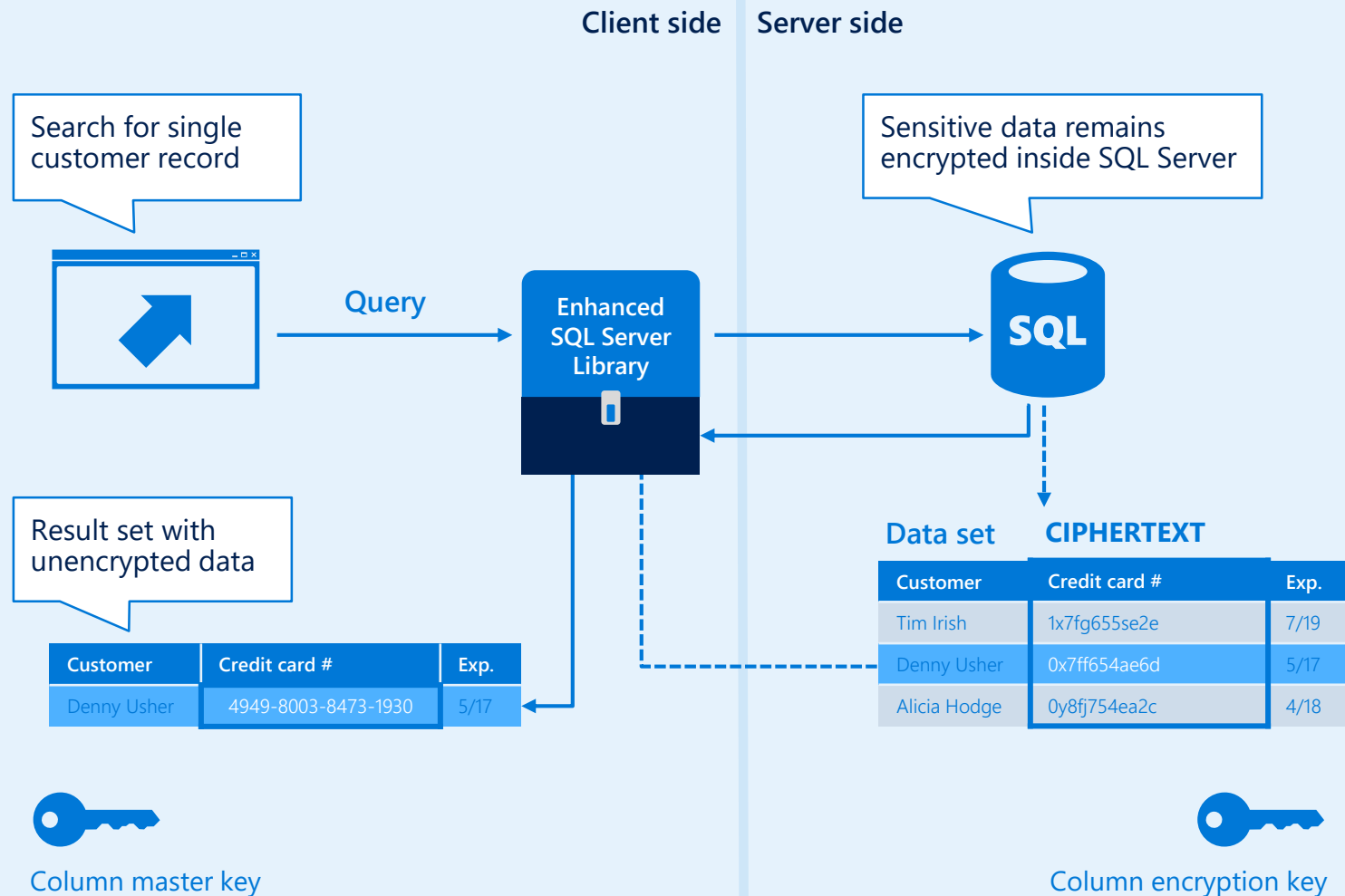
- Create missing indexes
- Drop unused/duplicate indexes
- Force last good plan

Secure your data



Protect your data at all times on Windows and Linux

Always Encrypted



- **Most secure platform**, with the least vulnerabilities in the NIST vulnerability database
- Encrypt data at rest and in motion with **Always Encrypted** on new driver libraries
- Conceal sensitive information with **Dynamic Data Masking**
- Control access to database rows based on user characteristics with **Row-Level Security**
- File-level protection with **Transparent Data Encryption**

View active threats in Azure Portal

Threat Detection

The screenshot displays the Azure Security Center Threat Detection interface. On the left, a 'Security alerts' sidebar shows a filter for 'Security Center' and a list of alerts with counts (3, 3, 2, 2, 1, 1, 0). Below this is a bar chart showing 1 High and 3 Medium alerts. The main area shows a list of alerts with descriptions: 'Potential SQL Injection', 'Someone logged on to your SQL server from an unusual lo...', 'Logon by an unfamiliar principal', and 'A possible vulnerability to SQL Injection'. A detailed view of the 'Potential SQL Injection' alert is shown on the right, including details like 'Potential SQL Injection was detected on your database samplecrmdemo on server samplecrmdemo.database.windows.net', 'Tuesday, March 28, 2017 10:24:41 PM', 'High' severity, 'Active' state, and 'samplecrmdemo' as the attacked resource. It also lists the subscription (Visual Studio Ultimate with MSDN) and the detected by (Microsoft).

DESCRIPTION
Potential SQL Injection
Someone logged on to your SQL server from an unusual lo...
Logon by an unfamiliar principal
A possible vulnerability to SQL Injection

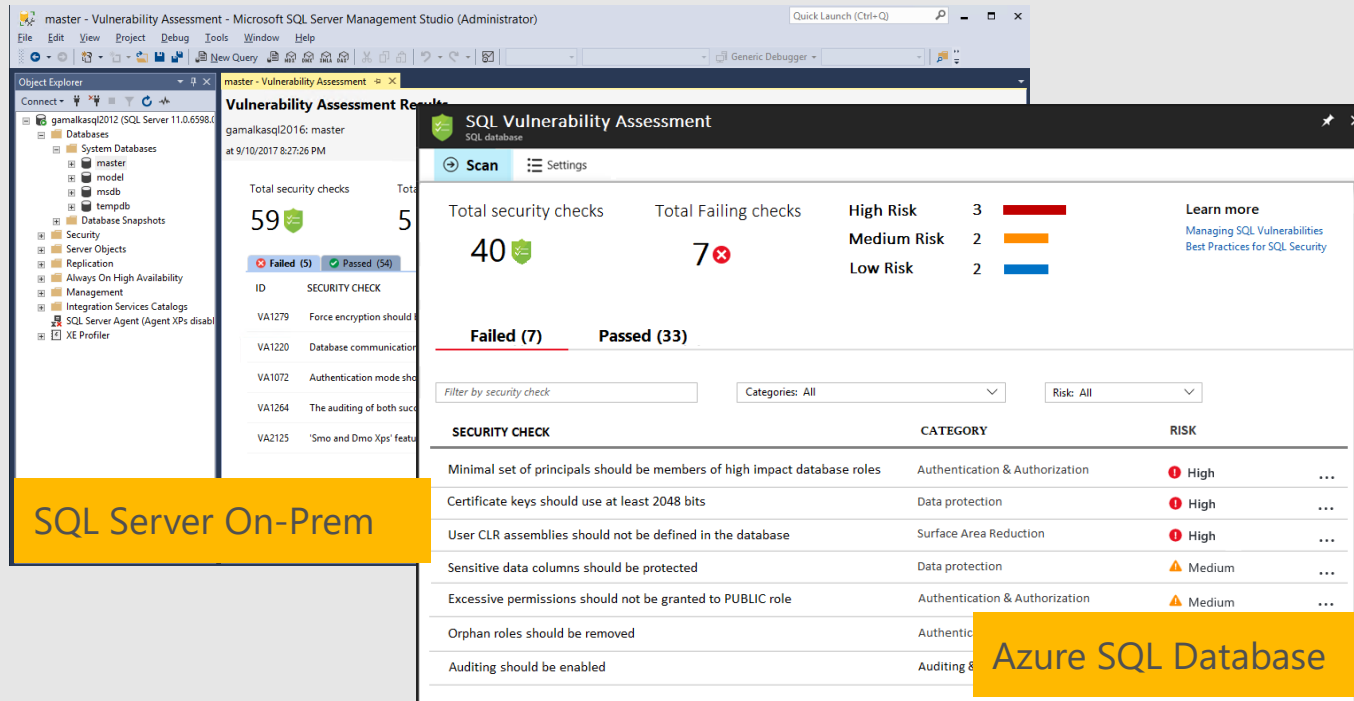
DESCRIPTION	STATE	ATTACKED RESOURCE	SUBSCRIPTION	DETECTED BY	ACTION TAKEN	INVESTIGATION STEPS	REMEDIAL STEPS
Potential SQL Injection was detected on your database samplecrmdemo on server samplecrmdemo.database.windows.net	Active	samplecrmdemo	Visual Studio Ultimate with MSDN (29442309-b49b-4be0-b660-98cc613cde49)	Microsoft	Detected	View the vulnerable SQL statement	Read more about this type of threat and how to fix the vulnerable code

- ✓ SQL security tiles within the database blade
- ✓ SQL security alerts in Azure Security Center

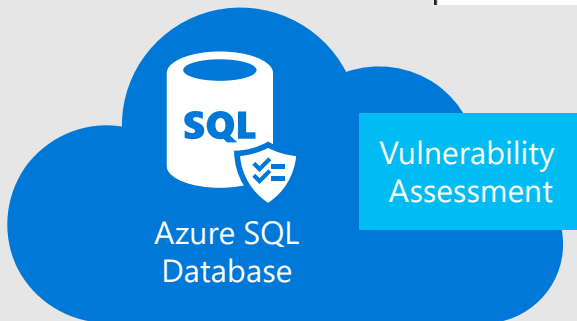
The screenshot shows two tiles from the Azure Portal. The top tile is titled 'Threat Detection' and describes it as a service that 'Detects anomalous database activity for potential security threats.' It has a 'CONFIGURED' status with a green dot. The bottom tile is titled 'Threat detection alerts' and shows a red exclamation mark icon. It states: 'There are 9 alerts (4 critical, 2 new) for this database. Click here to review.'

Track and improve database security state

Vulnerability Assessment (VA)

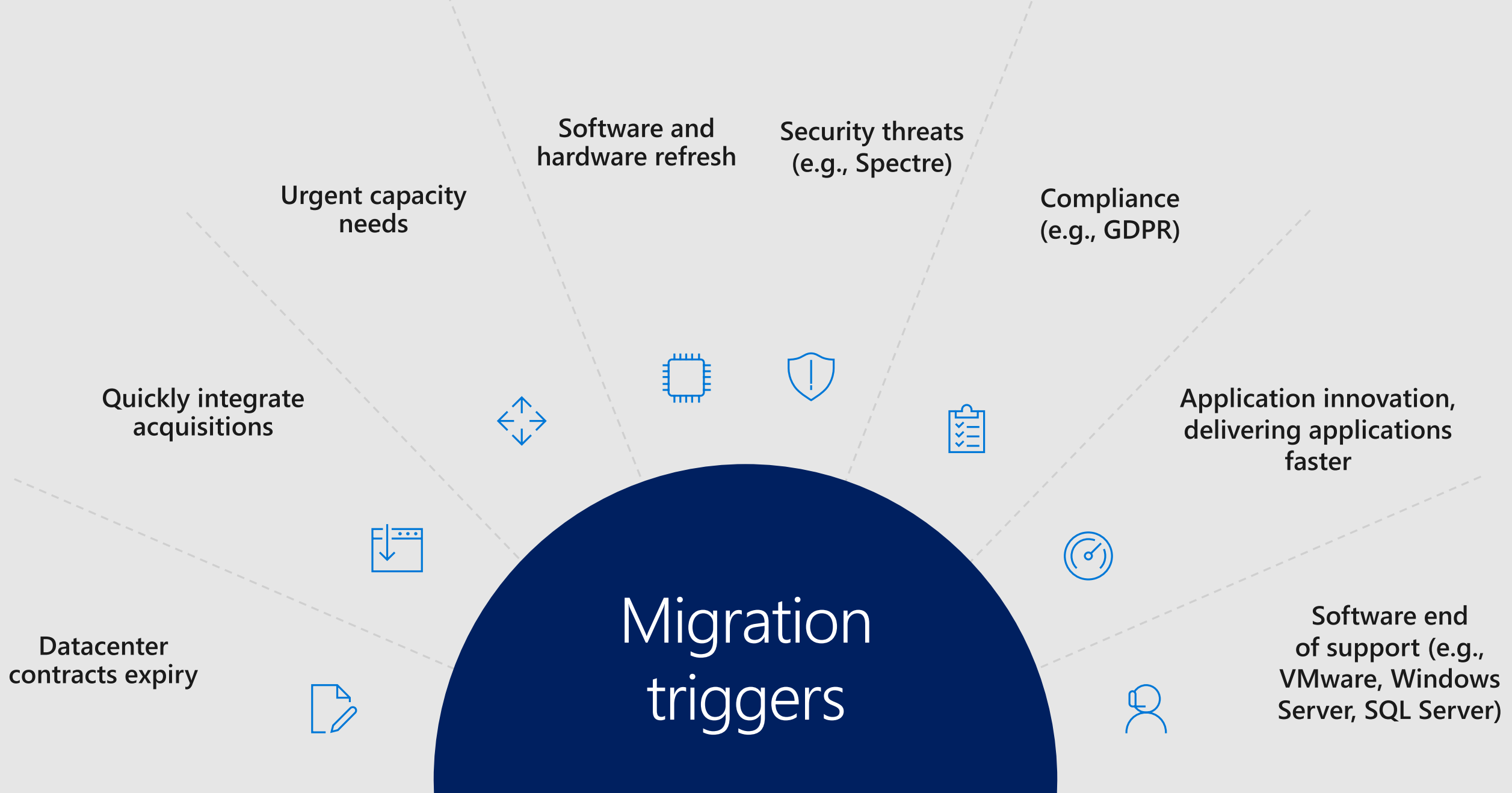


- ✓ Just run a scan
- ✓ Discover sensitive data that is not protected
- ✓ Identify & remediate security misconfigurations
- ✓ Coherent report that helps meet compliance requirements

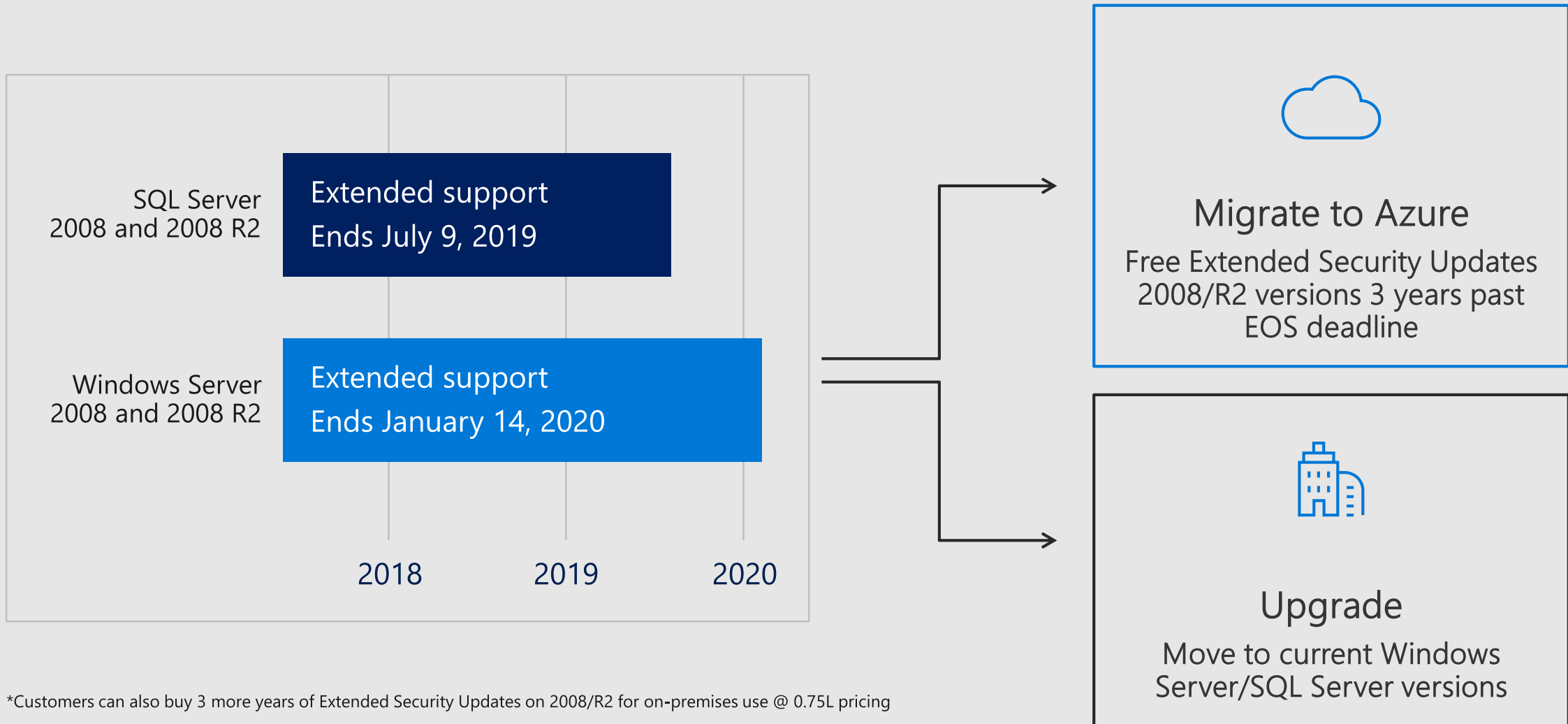


Identifies , tracks ,
resolves SQL security
vulnerabilities





Windows Server and SQL Server 2008/R2 end of support



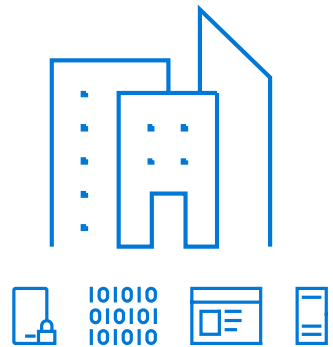
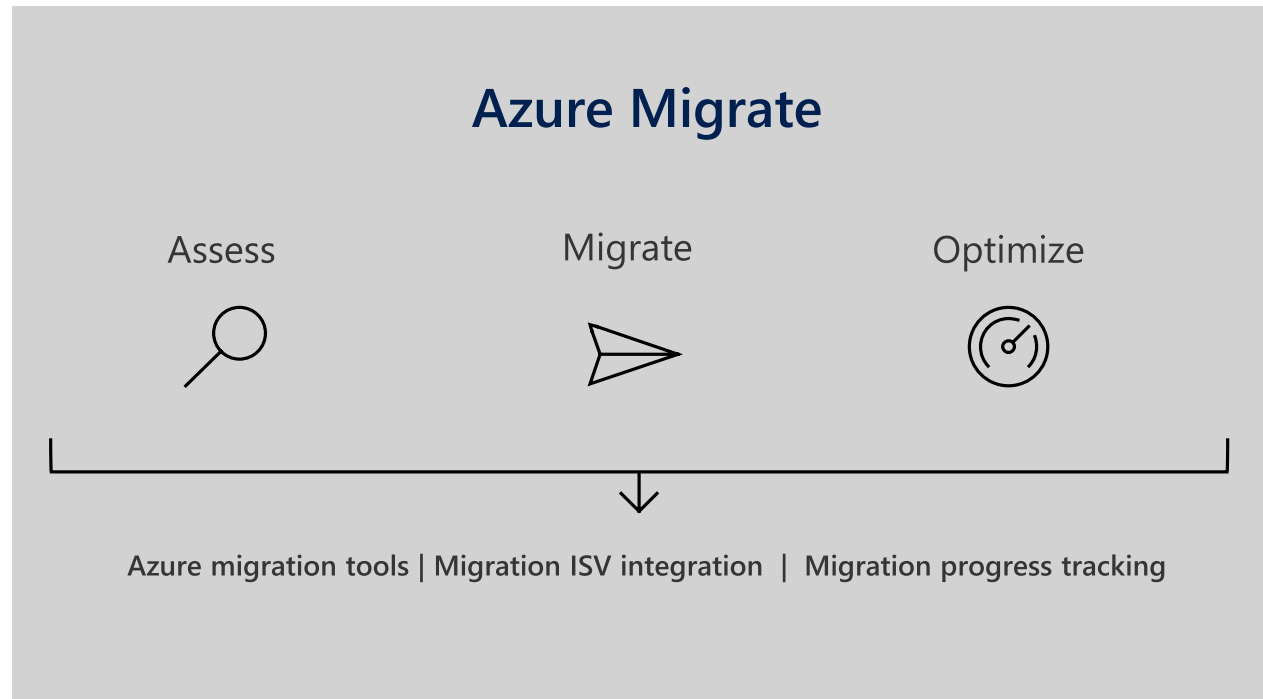
How do you successfully
Migrate Databases?



Azure migration experience

Do it yourself

Azure TCO calculator | Azure migration center | Azure Essentials



On-premises



Azure

Assisted

FastTrack for Azure | Managed Service Providers | Systems integrators

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

 **MOVE**RE

 **Cloudamize**

CloudAtlas[®]

 **BitTitan**

STRATO**ZONE**[®]

turbonomic

 **CloudEndure**[®]

 **Ispirer**

 **Corent**

 **intigua**

 **stiim**^{eu}

 **ATTUNITY**

 **DATOMETRY**

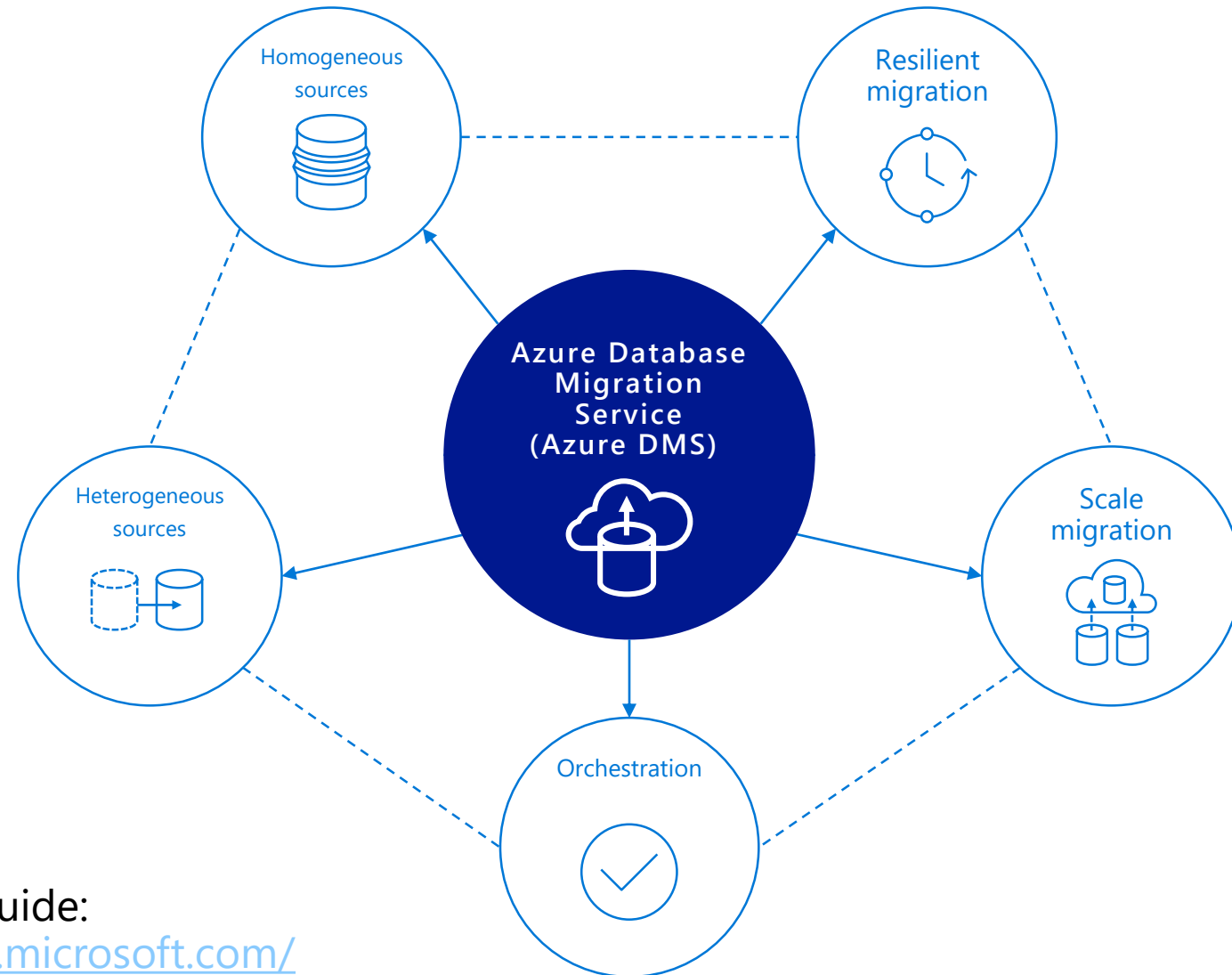
 **MORPHIS**

 **Informatica**

 **QuerySurge**

Azure Database Migration Service (DMS)

A seamless, end-to-end solution for moving on-premises SQL Server, Oracle, and other relational databases to the cloud



Database migration guide:

<https://datamigration.microsoft.com/>

Demo

- ✓ SQL Database Managed Instance
- ✓ Data Migration Assistant
- ✓ Azure **D**atabase **M**igration **S**ervice



Q&A



