Modernize in the Cloud with Azure SQL Database

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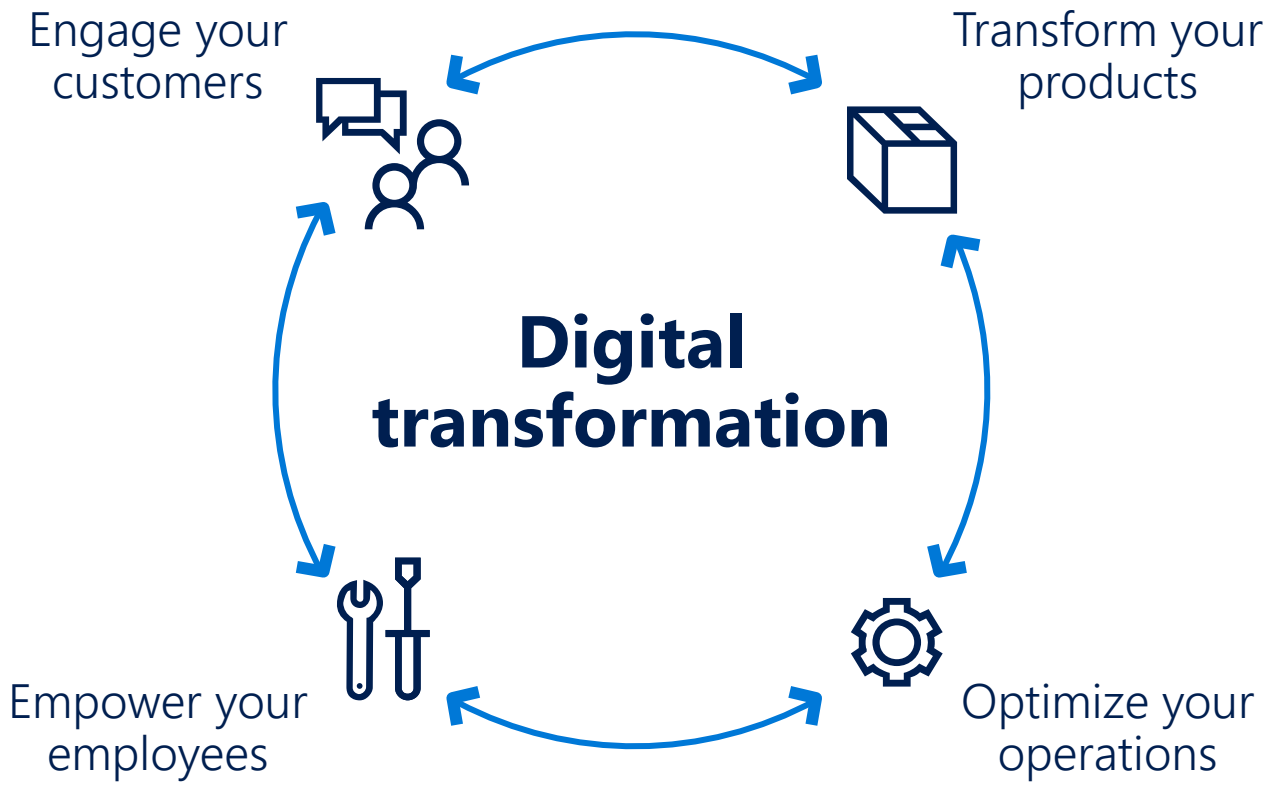
Microsoft

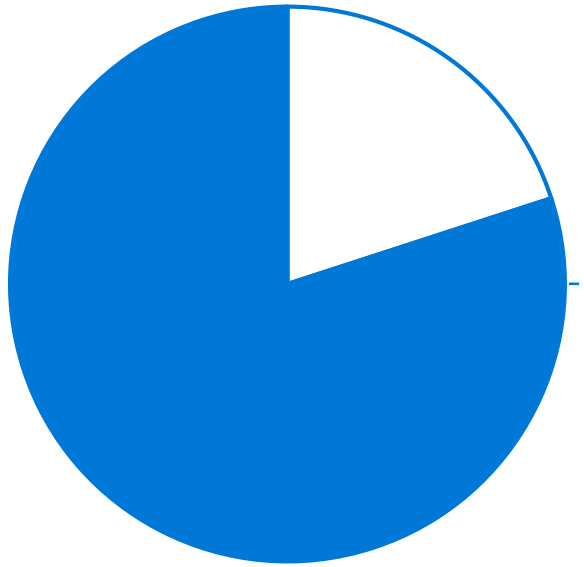
TECHNOLOGY IS SHAPING HOW BUSINESSES INNOVATE AND GROW



GETTING AHEAD MEANS GETTING TO THE CLOUD

Companies that embrace the cloud grow **19.6% faster**

More than **80% of organizations** now adopt cloud-first strategies

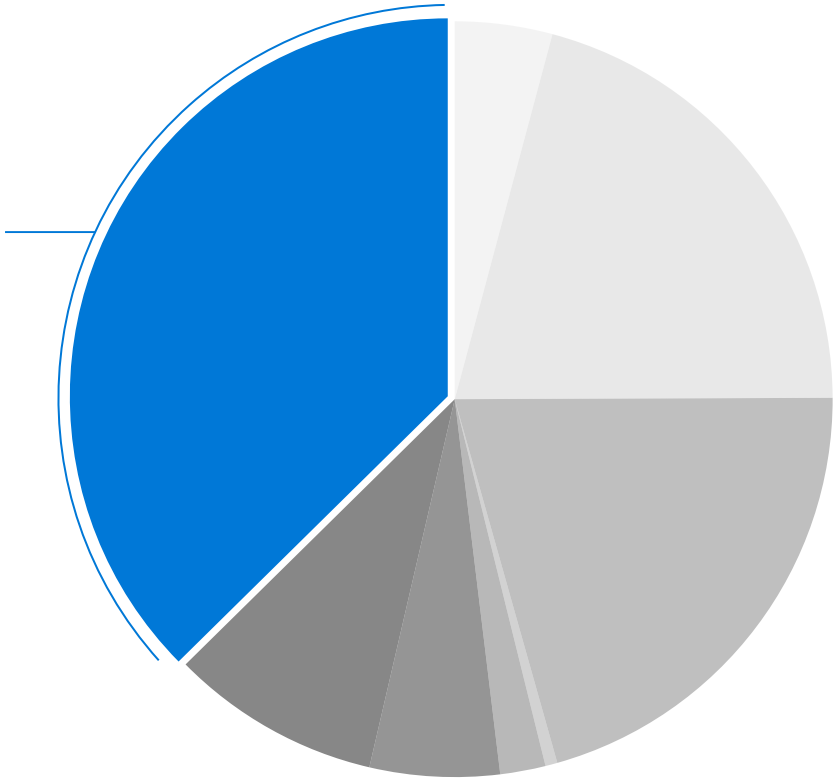


IT OPTIMIZATION IS KEY TO DIGITAL TRANSFORMATION

IDC Worldwide Database Server Forecast

SQL Server

37% of all units run Microsoft,
>50% of units run 2008/R2 or older[2]



Priorities

- Eliminate time spent managing "long tail" of applications—lift and shift to managed cloud
- Free up limited IT resources to drive transformation
- Migrate business critical apps to cloud—extend and innovate

[1] Pie Chart *IDC Worldwide DB Forecast Dec 2016
[2] Microsoft Internal Sources

AZURE SQL DATABASE

THE BEST AND MOST ECONOMICAL CLOUD DESTINATION FOR YOUR SQL SERVER APPS

Built-in intelligence

Breakthrough productivity and performance

Seamless and compatible

Competitive TCO

Realize up to a 406% ROI over on-premises and hosted solutions

AZURE SQL DATABASE MOMENTUM

4.5 million
databases

154 PB
total size

421k
subscriptions

3 trillion
batch requests/day

1.4 million
HTAP transactions/sec

100 million
queries analyzed/hour

"We had an incident lasting for about 6 months. Before Intelligent Insights we have not had a way of figuring out where do we even start troubleshooting. Intelligent Insights gave us a list of things to do…it enables us to pinpoint where the problem is and to get a fix deployed within 24hrs."

Frans Lytzen – CTO, New Orbit

neworbit
more than software

"Intelligent Insights proactively finds a database performance problem in a more efficient way and much faster than humans. With it we can proactively help customers until we have a fix for the problem."

Bauke Stil, App Manager, SnelStart

snelstart

"SQL Threat Detection helps us to be ahead of the threats instead of chasing them."

Shahin Kohan, CTO

AIMS360
FASHION TECHNOLOGY

"SQL Threat Detection helps us respond to activities, which were not visible beforehand."

Manrique Logan, architect & technical lead

ASEBA®

INTRODUCING AZURE SQL DATABASE MANAGED INSTANCE

Azure SQL Database

Managed Instance

Instance-scoped programming model with high compatibility to SQL Server

Best for modernization at scale with low cost and effort

Single

Standalone managed database for predictable and stable workloads

Elastic Pool

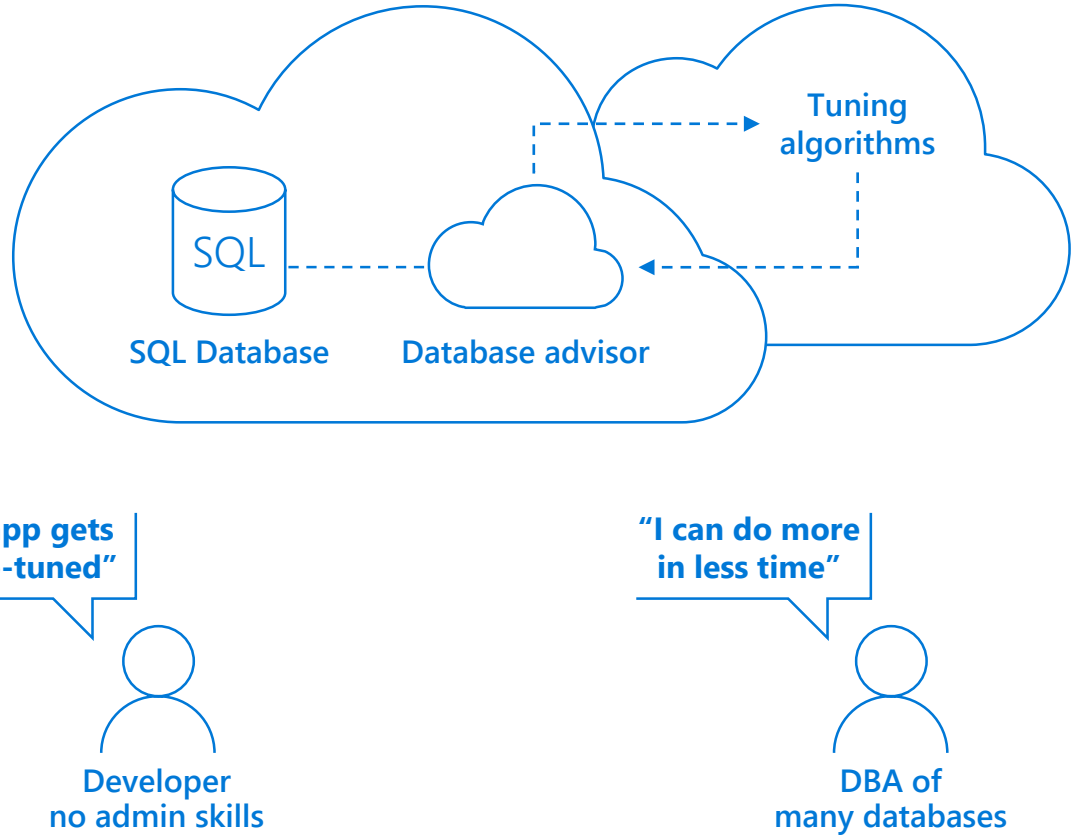
Shared resource model for greater efficiency through multi-tenancy

BUILT-IN INTELLIGENCE TO PROTECT AND OPTIMIZE

Built-in intelligence learns unique database patterns and automatically tunes for improved performance

Intelligent Threat Detection monitors, detects, and alerts on malicious activities

Vulnerability Assessment discovers, tracks and remediates potential database vulnerabilities



CONTINUOUSLY OPTIMIZED BY THE PLATFORM

One-click to enable

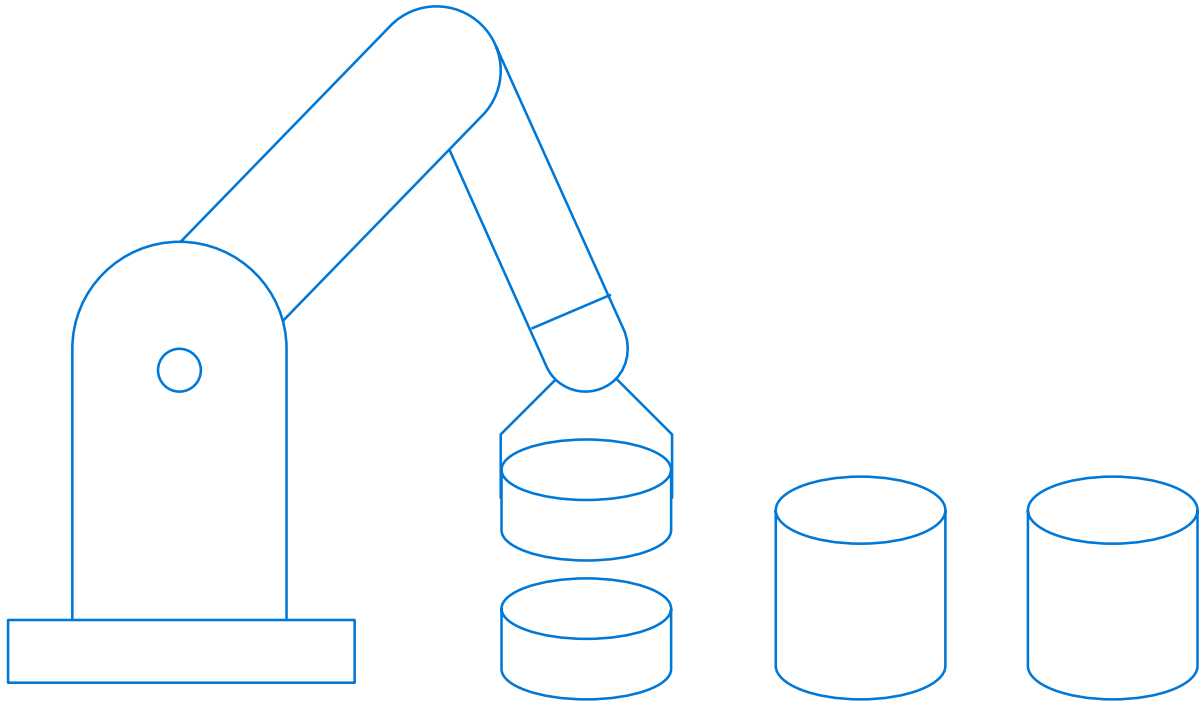
Prevent and mitigate issues

No app changes needed

Tuning actions

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

Automatic tuning



FOCUS ON YOUR BUSINESS

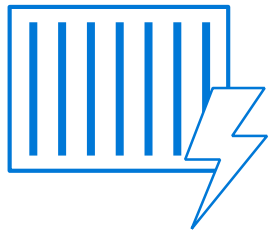
Your work so far	How PaaS helps
Hardware purchasing and management	**Built-in** scale on-demand
Protect data with backups (with health checks and retention)	**Built-in** point-in-time restore
High availability implementation	**Built-in** 99.99% SLA and auto-failover
Disaster recovery implementation	**Built-in**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

We take care of your database chores

BREAKTHROUGH PRODUCTIVITY AND PERFORMANCE

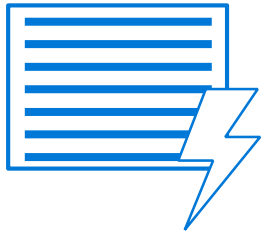
Realize the benefits of real-time operational analytics

Enable scale-up with near zero downtime through cloud-born innovation



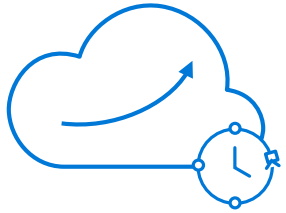
30x

faster transactions with in-memory OLTP



100x

performance gains with in-memory analytics



near 100%

uptime with dynamic scalability

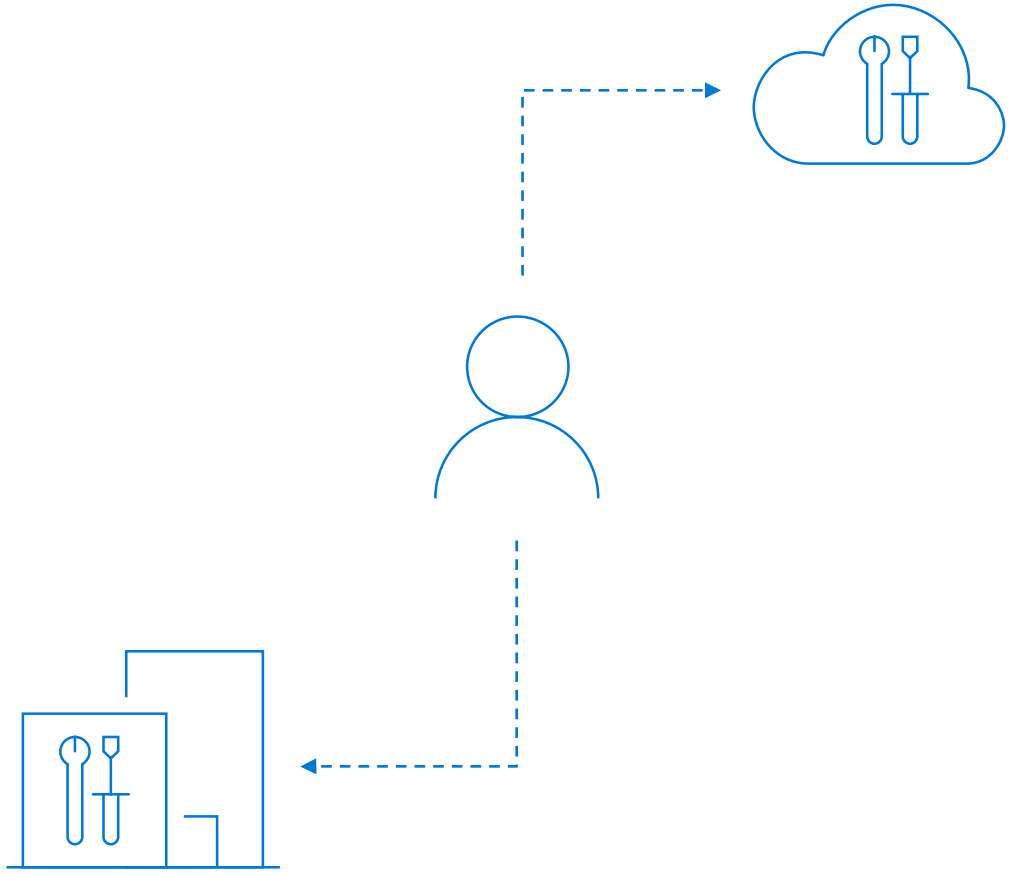
SAVE TIME WITH FAMILIAR SQL SERVER TOOLS AND RESOURCES

Eliminate app changes with full SQL Server programming surface

Use familiar SQL Server features in SQL Database Managed Instance

- Native backup and restore
- Cross-database queries and transactions
- Broad security features including Transparent Data Encryption, SQL Audit, Always Encrypted and Dynamic Data Masking
- SQL Agent, DBMail, and Alerts for workload orchestration improved awareness
- Scenario enablers including Change Data Capture, Service Broker, Transactional Replication, and CLR
- DMVs, XEvents, and Query Store for troubleshooting

Full compatibility with SQL Server 2005+



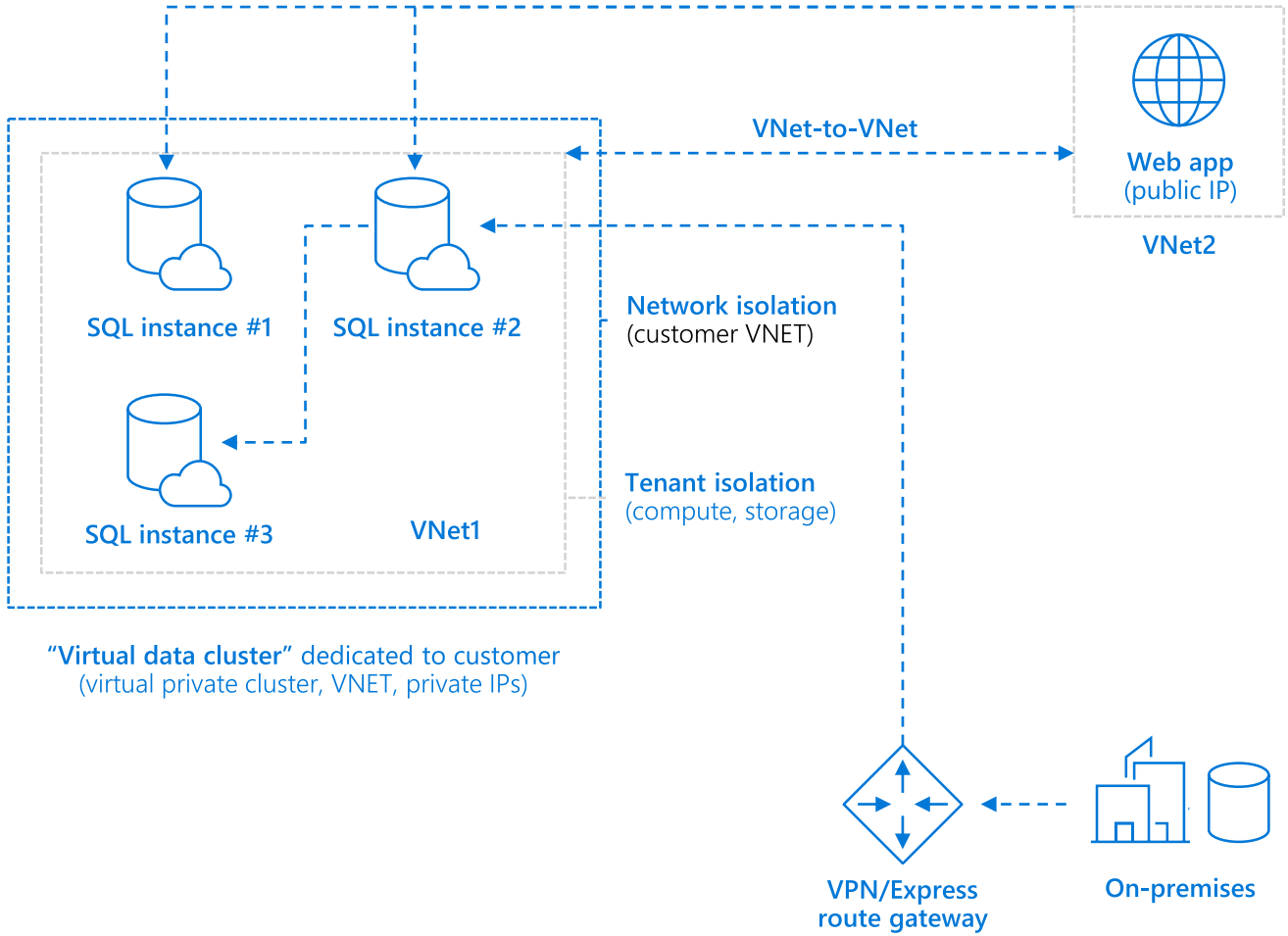
DEDICATED RESOURCES THROUGH CUSTOMER ISOLATION

Enable full isolation from other tenants without resource sharing

Promote secure communication over private IP addresses with native VNET integration

Enable your on-premise identities on cloud instances, through integration with Azure Active Directory and AD Connect

VNET support in SQL Database Managed Instance



COMPETITIVE TOTAL COST OF OWNERSHIP

Reduce capital and operational costs with fully-managed service and achieve up to 406% ROI[1]

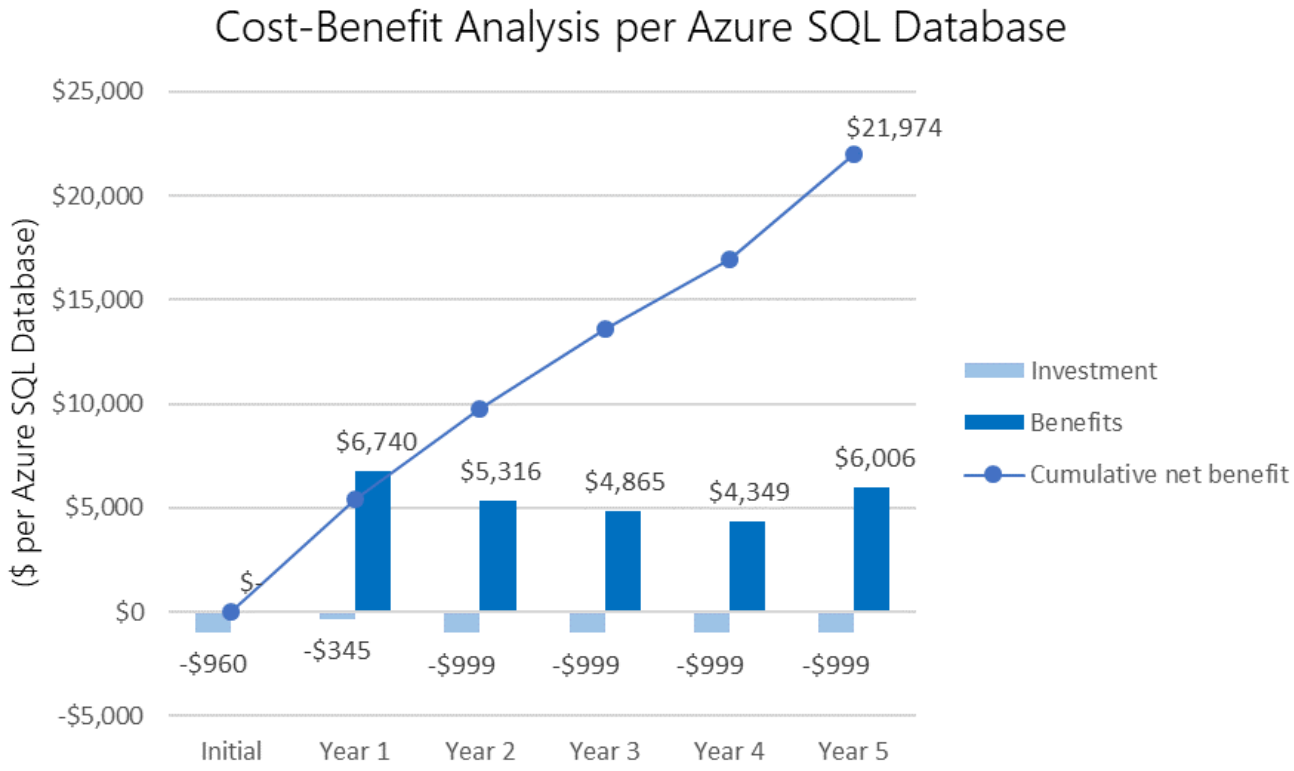
Financially-backed 99.99% availability SLA[2]

Promote business continuity with built-in capabilities

Maximize your on-premises investments with Azure Hybrid Benefit for SQL Server

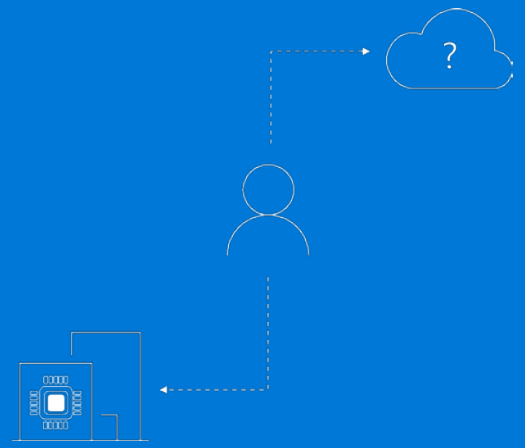
Right-size on-premises workload requirements for the cloud with independent control of storage and compute

Up to 406% ROI with Azure SQL Database

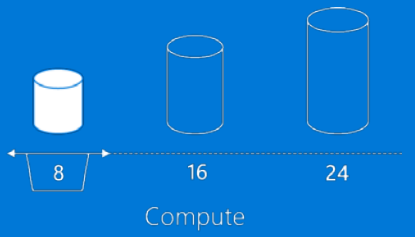


Adapted from The Business Value of Microsoft Azure SQL Database Services, IDC, March 2015.

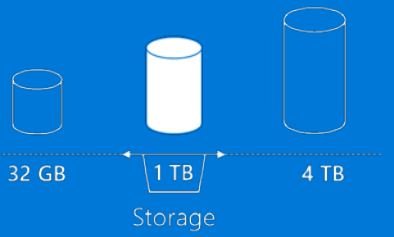
DTUs SIMPLIFY CERTAIN ELEMENTS FOR CUSTOMERS BUT CAN MAKE ON-PREMISES TRANSITIONS DIFFICULT



Challenges with translating on-premises workload requirements to the cloud when migrating



More flexibility desired to optimize resources for SQL Database workloads



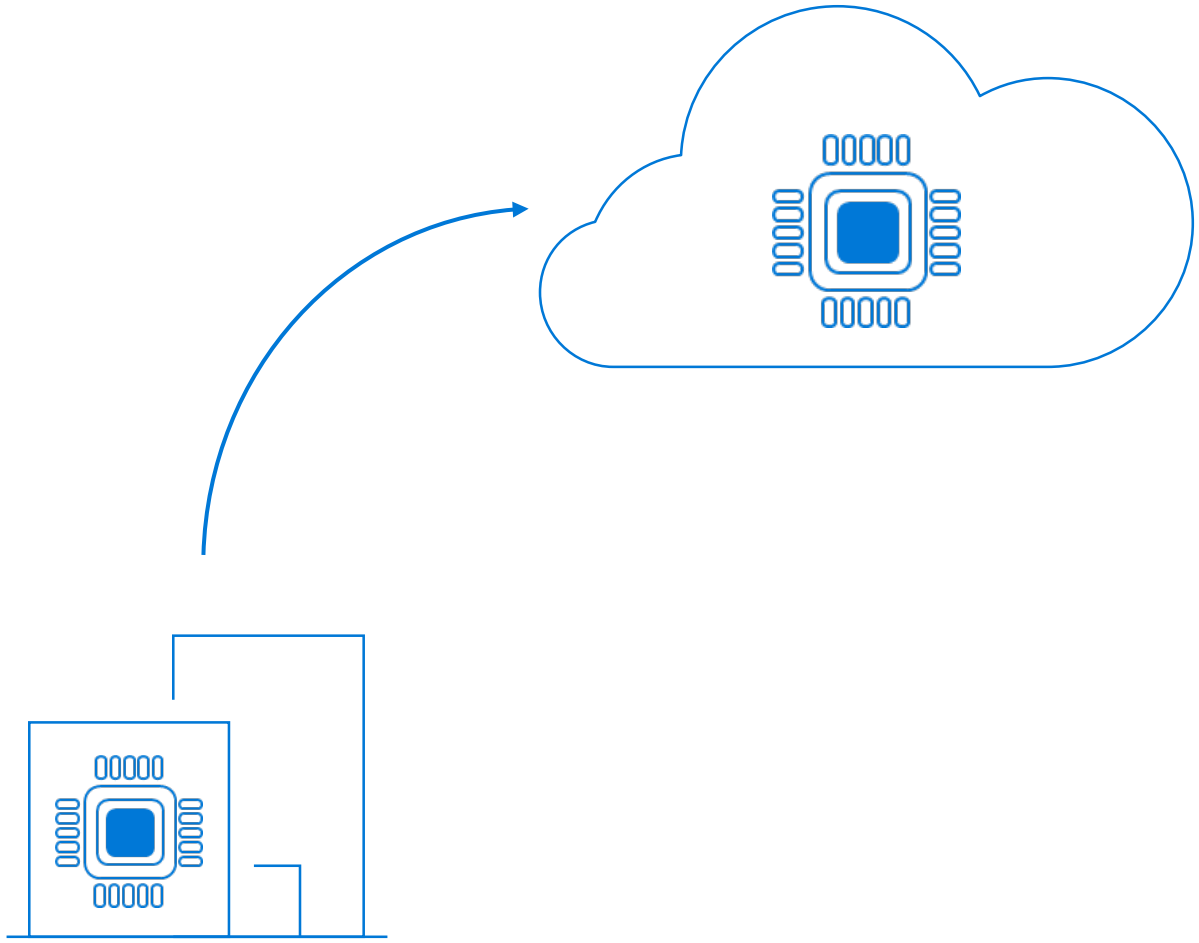
RIGHT-SIZE YOUR WORKLOADS FOR THE CLOUD

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

You pay only for what you use

1 on-premises core = 1 vCore on Gen4 hardware

Introducing vCores



COMMITTED TO CUSTOMER CHOICE

Choice drives our approach to resource management and pricing

- **Simplicity**: We remain committed to 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

You pay for:

Service tier + number of vCore
Type and amount of data storage
Number of IO*
Backup storage (RA-GRS)*

The vCore-based model will exist alongside the DTU-based model

Learn more

*Free during preview
**4TB available on Gen 5 only
***Coming soon

Choose from two tiers in the vCore-based model

	GENERAL PURPOSE		BUSINESS CRITICAL	
Best for	Most business workloads. Offers budget oriented balanced and scalable compute and storage options.		Business applications with high IO requirements. Offers highest resilience to failures using several isolated AlwaysON replicas.	
Compute tiers	Two hardware generations to choose from			
	Single/Elastic Pools	Managed Instance	Single/Elastic Pools	Managed Instance
	1 to 80 vCores	8, 16, 24, 32, 40, 64, 80 vCores	1 to 80 vCores	8, 16, 24, 32, 40, 64, 80 vCores
Storage	Premium remote storage (per instance)		Super-fast local SSD storage (per instance)	
	Single/Elastic Pools	Managed Instance	Single/Elastic Pools	Managed Instance
	5GB – 4TB	32GB – **8TB**	5GB – 4TB	32GB – 4TB**
Availability	1 replica, no read-scale		3 replicas, 1 read-scale, zone-redundant HA***	
Backups	RA-GRS, 7-35 days (7 days by default)		RA-GRS, 7-35 days (7 days by default)	

SELECTING THE RIGHT PURCHASING OPTION

Flexibility

vCore-based

Independently configure compute, storage, IO

Most economical with Azure Hybrid Benefit for SQL Server

Simplicity

DTU-based

Blended measure of compute, storage, IO

May be more economical for < 3 cores

- Compare vCore-based and DTU-based options using this rule of thumb: **100DTU ~ 1 vCore**
- Convert from DTU to vCore using the API or portal with no downtime and same SLO update as today

AZURE IS THE MOST ECONOMICAL DESTINATION FOR SQL WORKLOADS*

Use your on-premises SQL Server licenses with active Software Assurance to save up to 55% on vCore-based SQL Database deployment options with **Azure Hybrid Benefit for SQL Server**

Pre-pay your SQL Database compute capacity on a one or three-year term and save up to 33% with **SQL Database reserved capacity**

Combine the Azure Hybrid Benefit for SQL Server and SQL Database reserved capacity for even more savings, **up to 80%.**

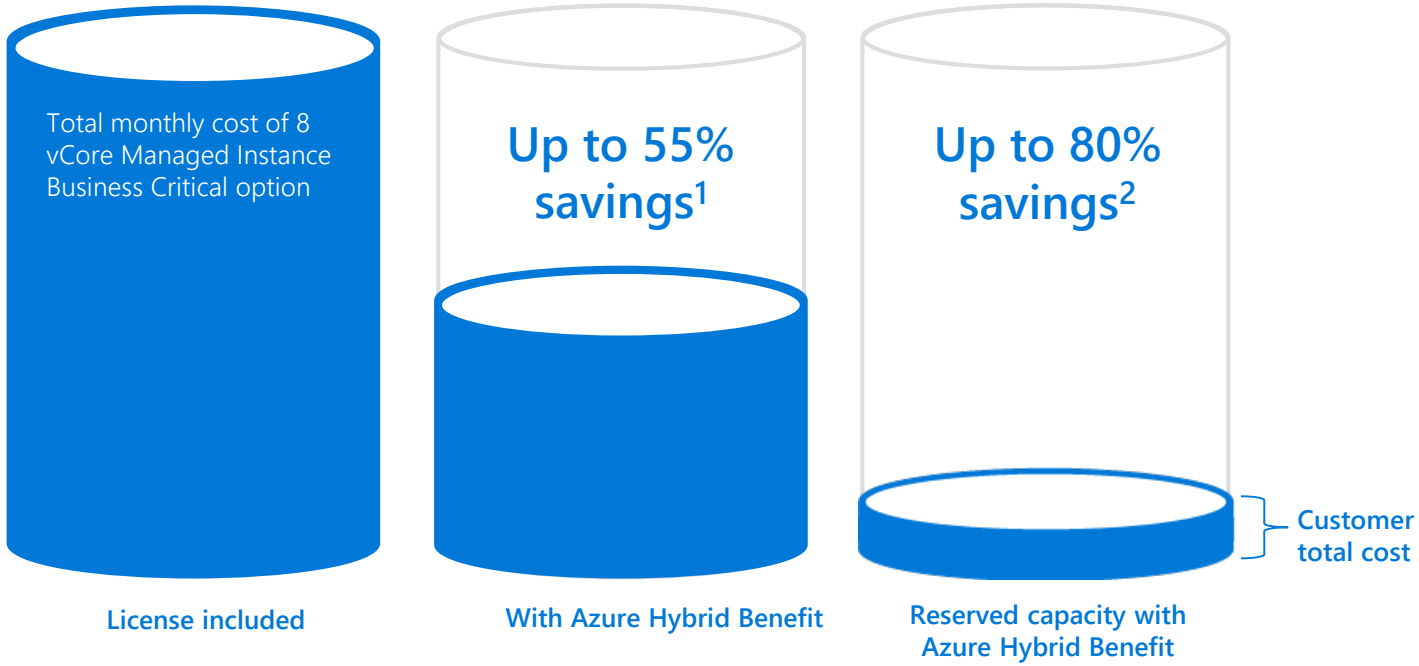
Learn more:

Azure Hybrid Benefit

Azure SQL Database reserved capacity

*Based upon comparison of on-demand pricing on Azure for Managed Instance versus running SQL on AWS RDS.

Save up to 80% with Azure Hybrid Benefit for SQL Server and SQL Database reserved capacity



[1] Savings based on eight vCore Managed Instance Business Critical in East US Region, running 730 hours per month. Savings are calculated from full price (license included) against base rate (applying Azure Hybrid Benefit for SQL Server), which excludes Software Assurance cost for SQL Server Enterprise edition, which may vary based on EA agreement. Actual savings may vary based on region, instance size and performance tier. Prices as of May 2018, subject to change.
[2] Savings based on eight vCore SQL Database Managed Instance Business Critical in West 2 US Region, running 730 hours per month. Savings are calculated from on demand full price (license included) against base rate with Azure Hybrid Benefit plus 3-year reserved capacity commitment. Savings excludes Software Assurance cost for SQL Server Enterprise edition, which may vary based on EA agreement. Actual savings may vary based on region, instance size and performance tier. Prices as of May 2018, subject to change.

EXCLUSIVE TO AZURE: GET MORE FOR YOUR VIRTUALIZED WORKLOADS

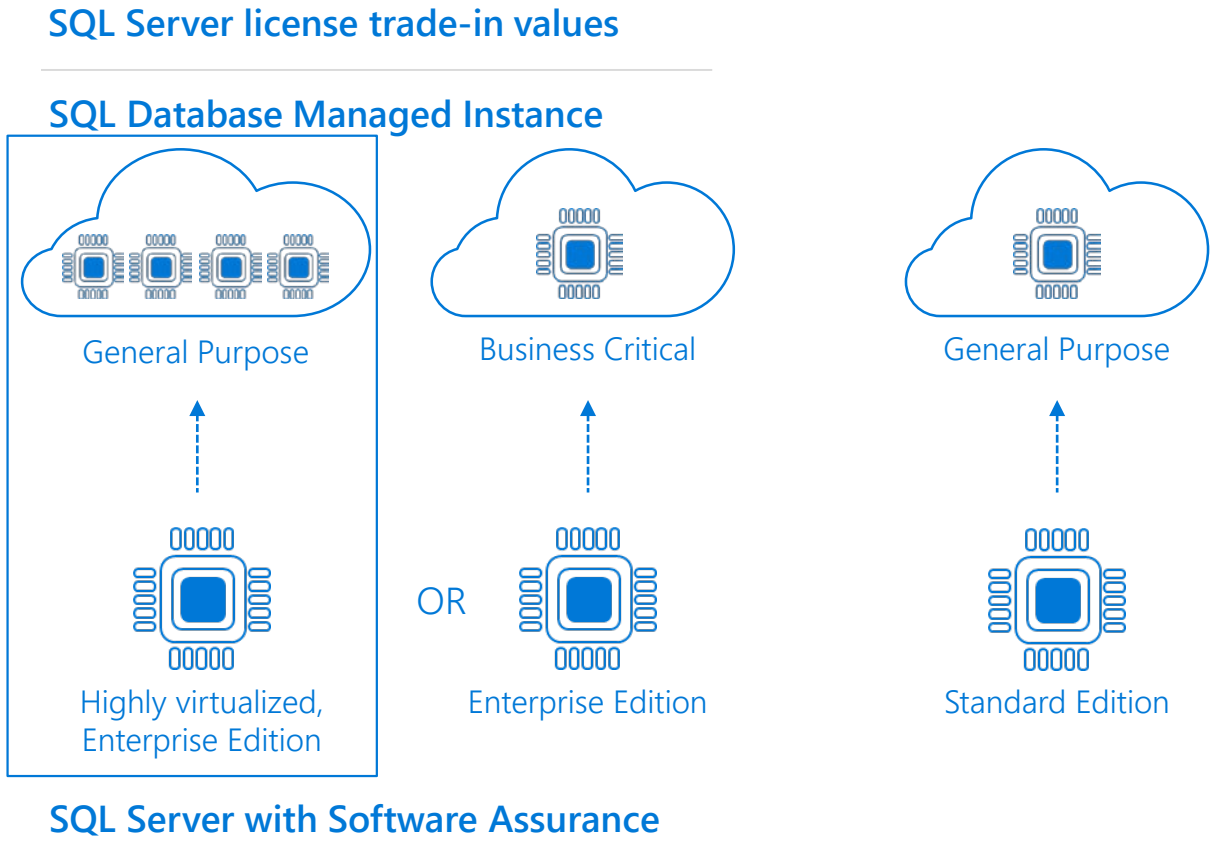
Take an inventory of on-premises licenses to determine potential for conversion

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

1 Standard license core = 1 General Purpose core

1 Enterprise license core = 1 Business Critical core

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



Tools for your migration journey

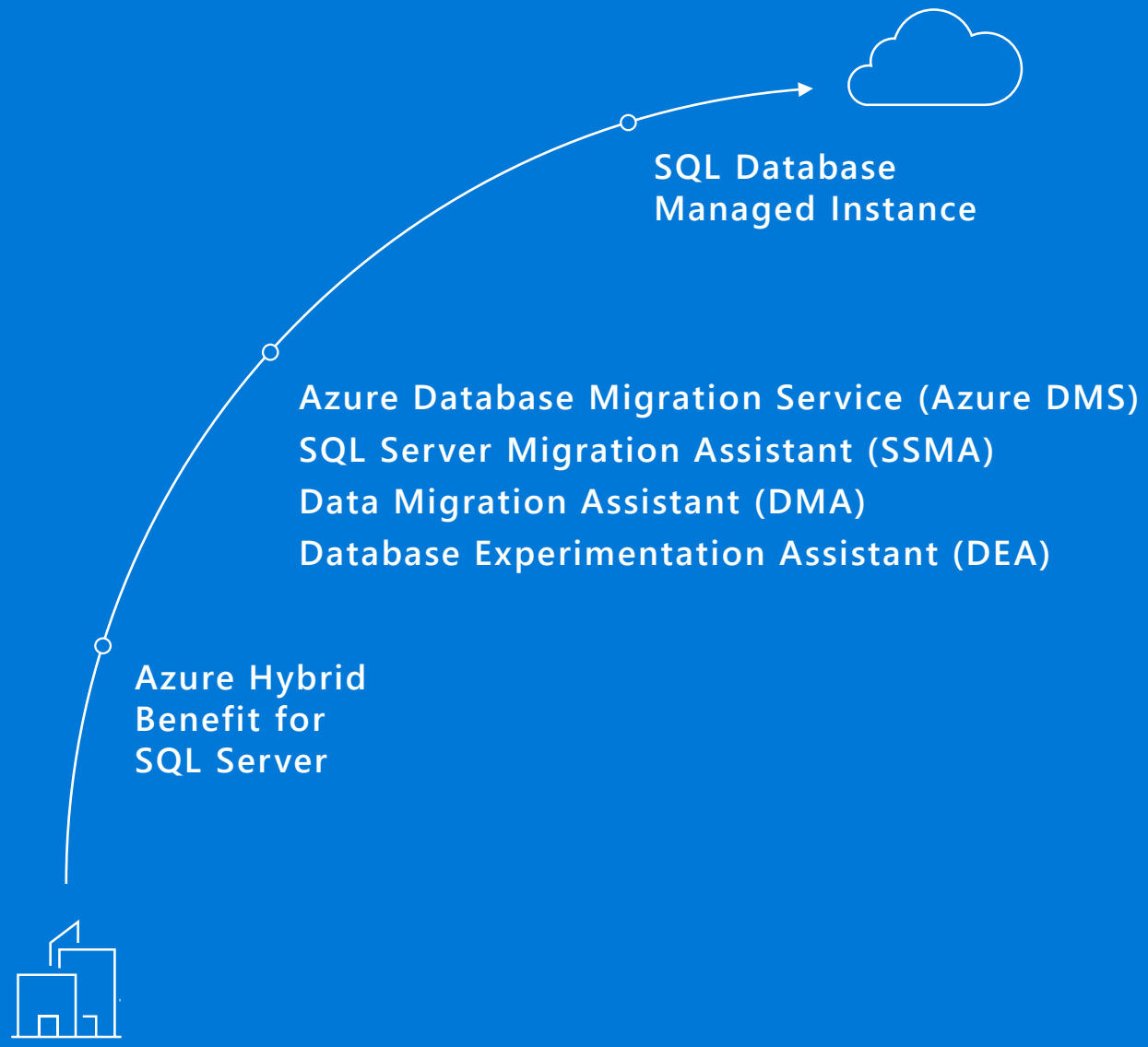
SQL Server Migration Assistant (SSMA)
Automates database migration to SQL Server from Microsoft Access, DB2, MySQL, Oracle, and SAP ASE.

Data Migration Assistant (DMA)
Enables upgrade to SQL Server and Azure SQL Database.

Database Experimentation Assistant (DEA)
Assists in evaluating a targeted version of SQL for a given workload.

Azure Hybrid Benefit for SQL Server
Maximizes current on-premises license investments to facilitate migration.

Azure SQL Database Managed Instance
Facilitates lift and shift migration from on-premises SQL Server to PaaS.



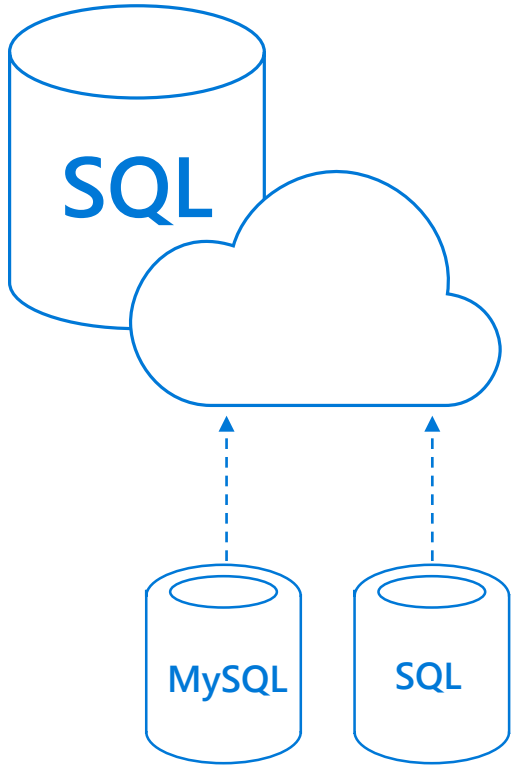
ACCELERATING YOUR JOURNEY TO THE CLOUD

Fully managed database migration service for both operational databases and data warehouses

Enables reliable and seamless migrations to the cloud *at scale and minimal downtime*

Migrate SQL Server & 3rd party databases to Azure SQL Database

Azure Database Migration Service



SQL Server	Azure SQL Database single, elastic pools and Managed Instance
MySQL	Azure Database for MySQL
PostgreSQL	Azure Database for PostgreSQL
Oracle, …	Azure SQL Database & Managed Instance
Netezza, …	Azure SQL Data Warehouse

YOUR SINGLE DESTINATION FOR ALL THINGS MIGRATION

Provides guidance, tools, and partners in context of your migration scenario

Enables you to:

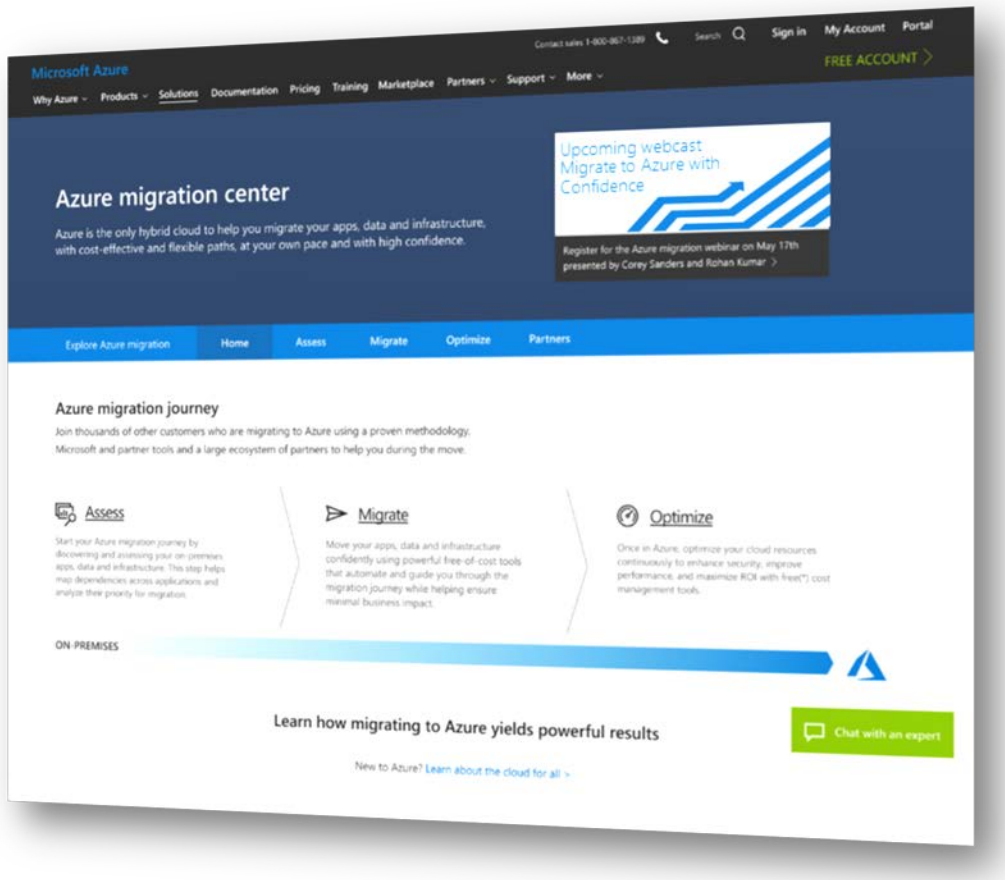
- Build your case, find others like you
- Assess your environment
- Identify the right migration strategies
- Optimize your cloud resources

Connects you to a migration expert

- Chat enabled, backed by engineering resources
- Guides you to FastTrack, partner, seller, or DIY outcomes

Azure.com/Migration

Azure migration center



MIGRATION COOKBOOK

Migrate an on-premises SQL Server database to Azure SQL Database

The Migration Cookbook describes various approaches you can use to migrate an on-premises SQL Server database to the latest Azure SQL Database Update

Download: https://azure.microsoft.com/en-us/resources/choosing-your-database-migration-path-to-azure/en-us/

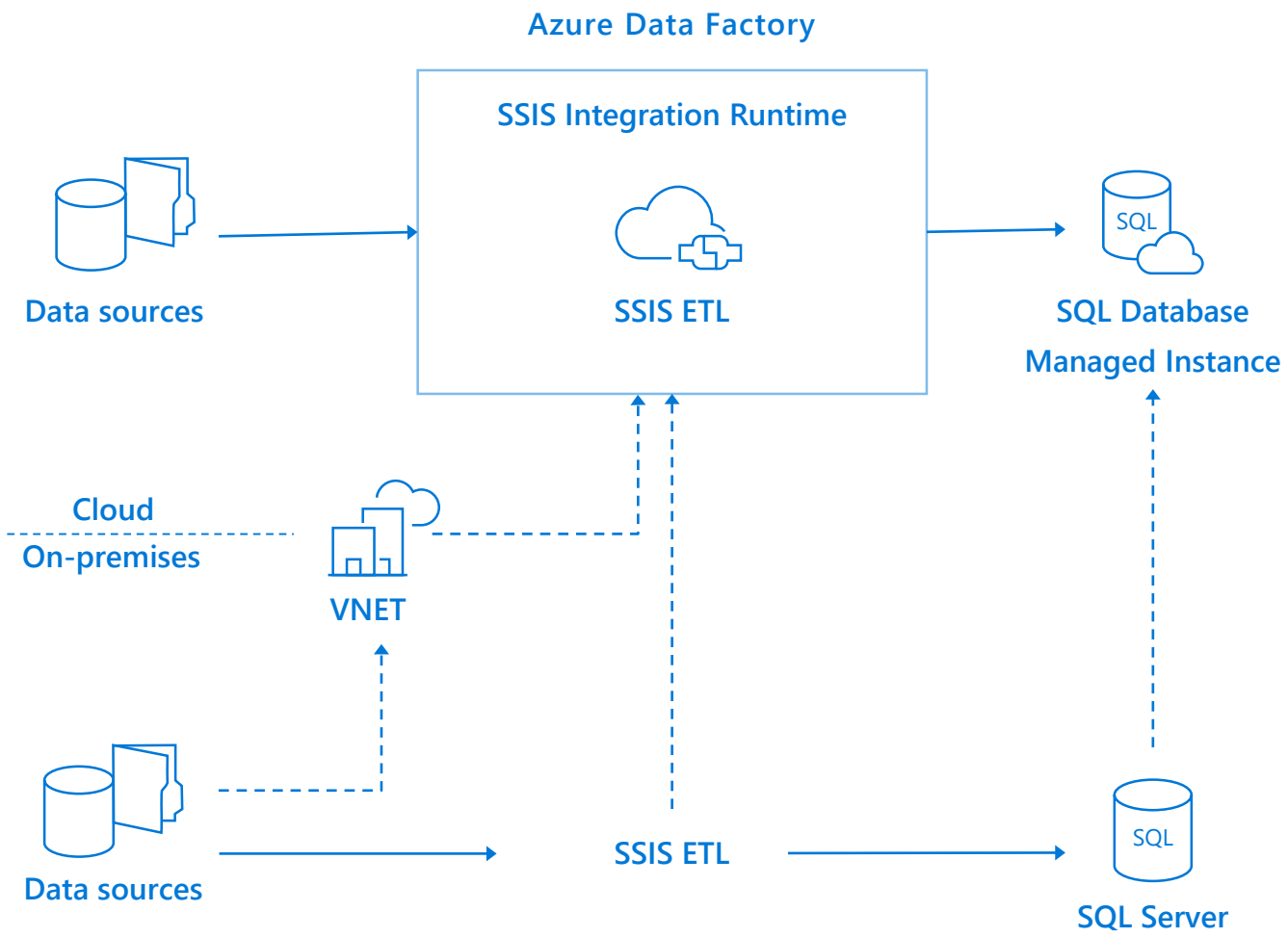
LIFT YOUR SQL SERVER INTEGRATION SERVICES (SSIS) PACKAGES TO AZURE

Easily execute and schedule your SQL Server Integration Services (SSIS) packages in managed execution environment for SSIS in Azure Data Factory (ADF)

Gain high availability, scalability and lower TCO by lifting your SSIS packages to Azure

Continue to build, monitor and manage packages with existing tools like SQL Server Management Studio (SSMS) & SQL Server Data Tools (SSDT)

Learn more



Available Q2 CY 2018

AZURE SQL DATABASE MANAGED INSTANCE PREVIEW

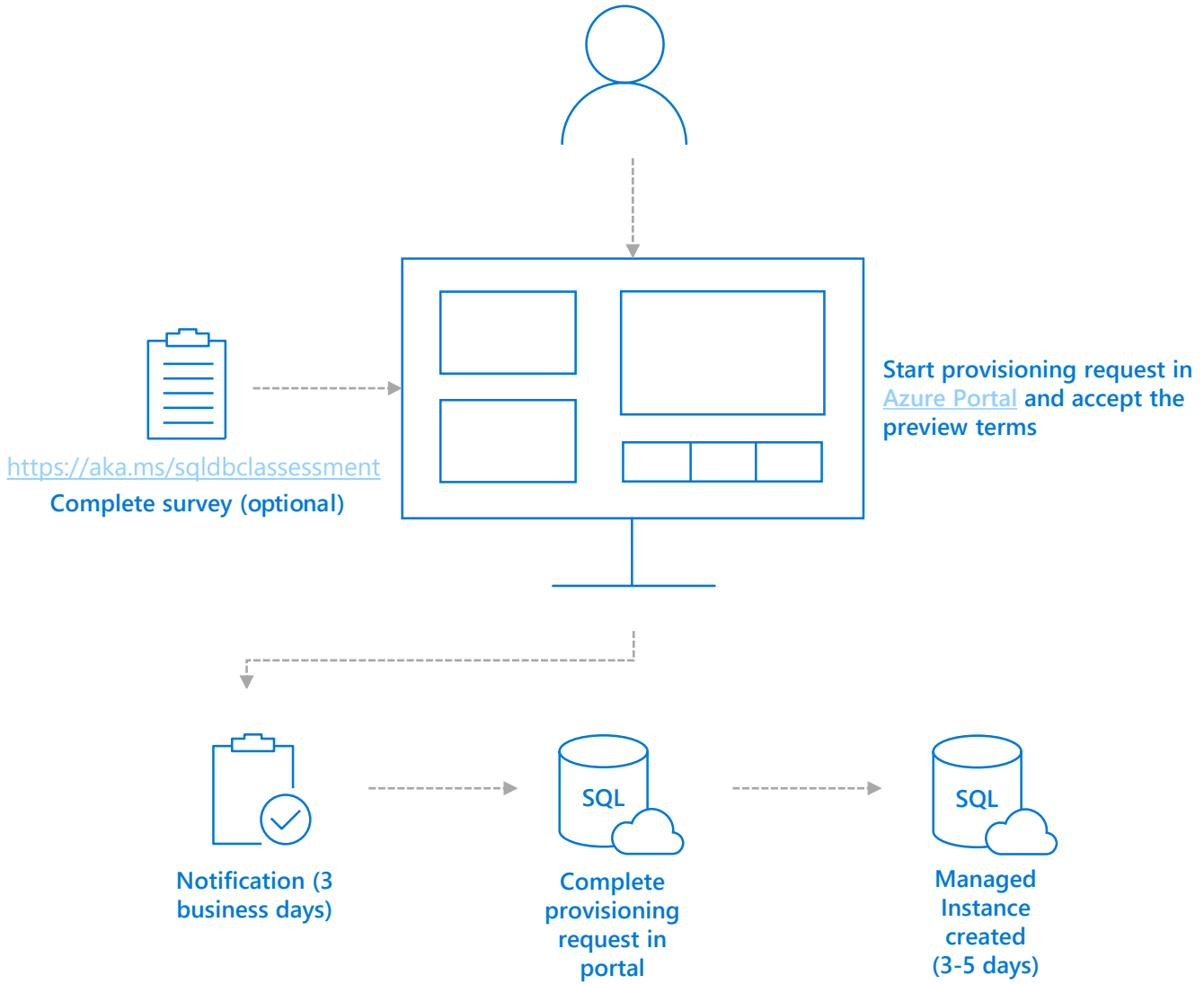
Submit a provisioning request for Managed Instance via Azure portal, accept the preview terms and complete the short form.

You will receive a response from Microsoft within 3 working days

Once approved, return to the portal to complete the provisioning request

Managed Instance created within 3-5 working days upon completing the provisioning request

Enroll today in Managed Instance preview



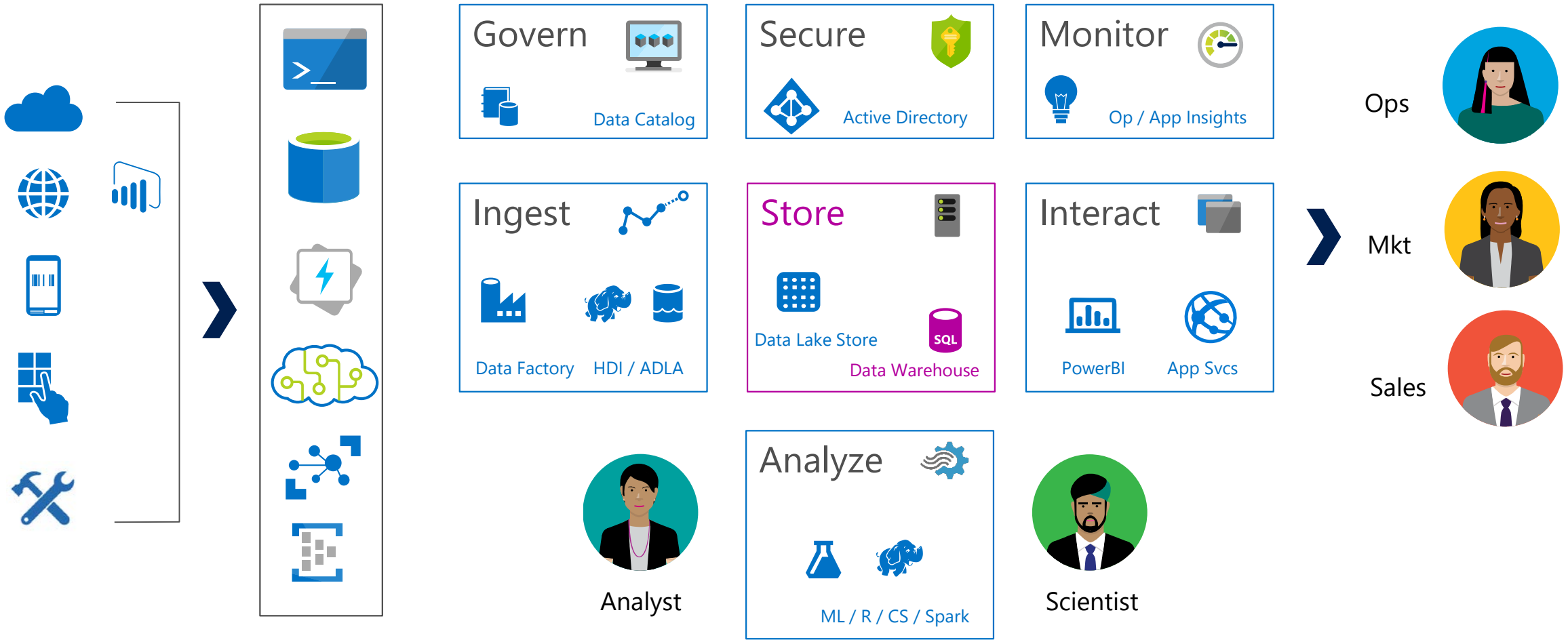
LEARN MORE

- Announcement blog
- Azure SQL Database
- SQL Database Managed Instance
- Create a Managed Instance
- Azure Hybrid Benefit for SQL Server
- Azure Database Migration Service
- Migration Guide
- SQL Server Integration Services
  - Hands-on-lab to lift SSIS to Azure with Azure Data Factory: aka.ms/adflab 2

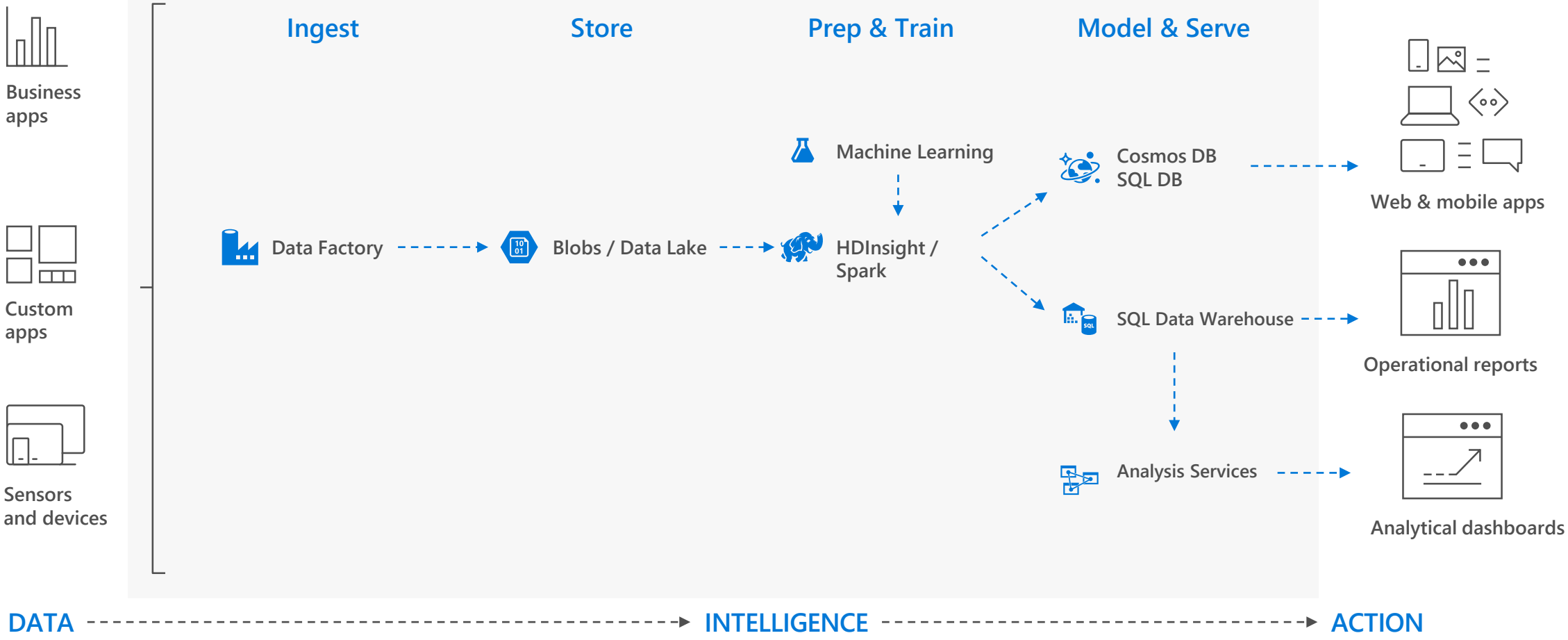
Azure SQL Data Warehouse

Where does a data warehouse fit? Everywhere!

Data & service architecture



CLOUD DATA WAREHOUSE SOLUTION



Changes in Enterprise Data Warehouse space

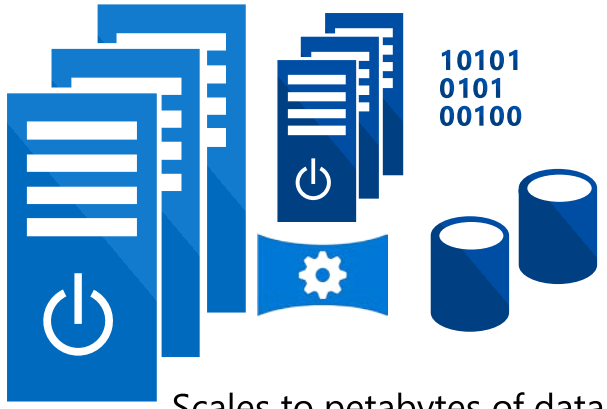
Organizations are changing with increasing demand to:

- Integrate with new or unstructured data
- Drive to the cloud
- Reduce or remove hardware renewal
- Reduction in support costs

Introducing Azure SQL Data Warehouse

A relational **platform-as-a-service**, fully managed by Microsoft.
Elastic scale cloud **data warehouse** with **proven** SQL Server capabilities.
Built for businesses of all **shapes, sizes,** and **industry**.

Elastic scale & performance



Scales to petabytes of data

Massively Parallel Processing

Instant-on compute scales in seconds

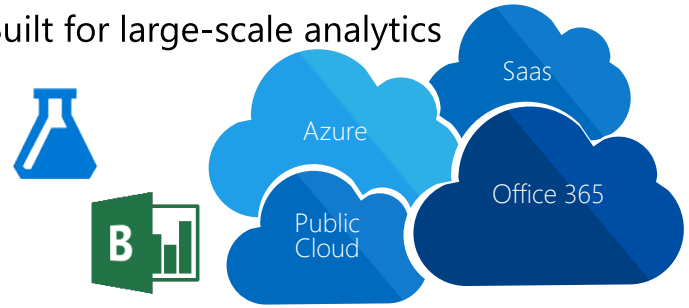
Query Relational and Non-Relational data

Relational batch processing

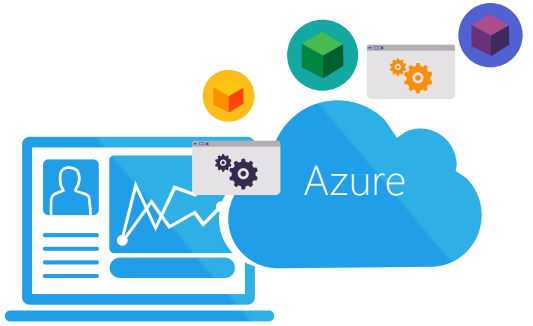
Query large datasets in minutes

Full hub-and-spoke support

Built for large-scale analytics



Market Leading Price & Performance

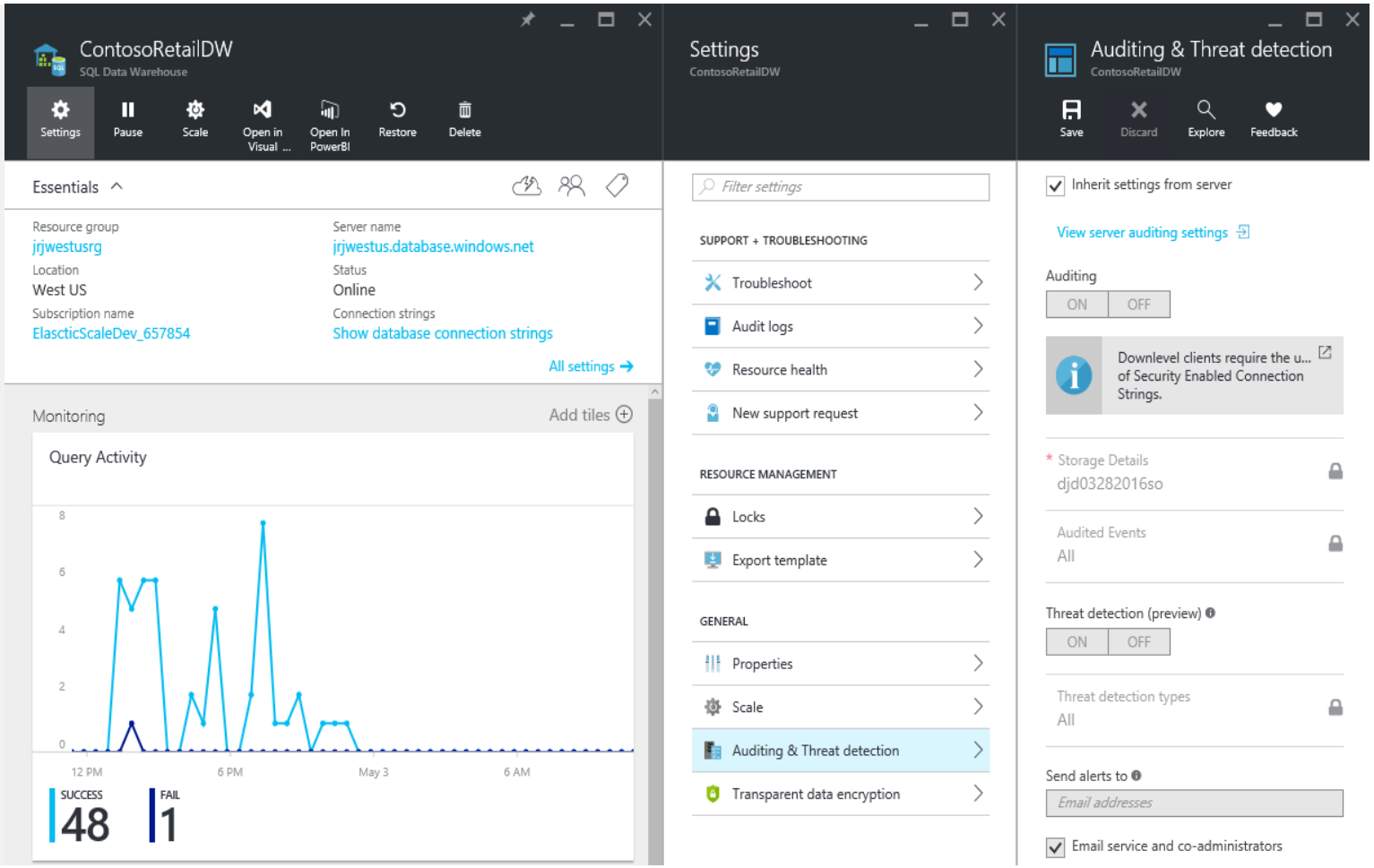


Simple billing compute & storage

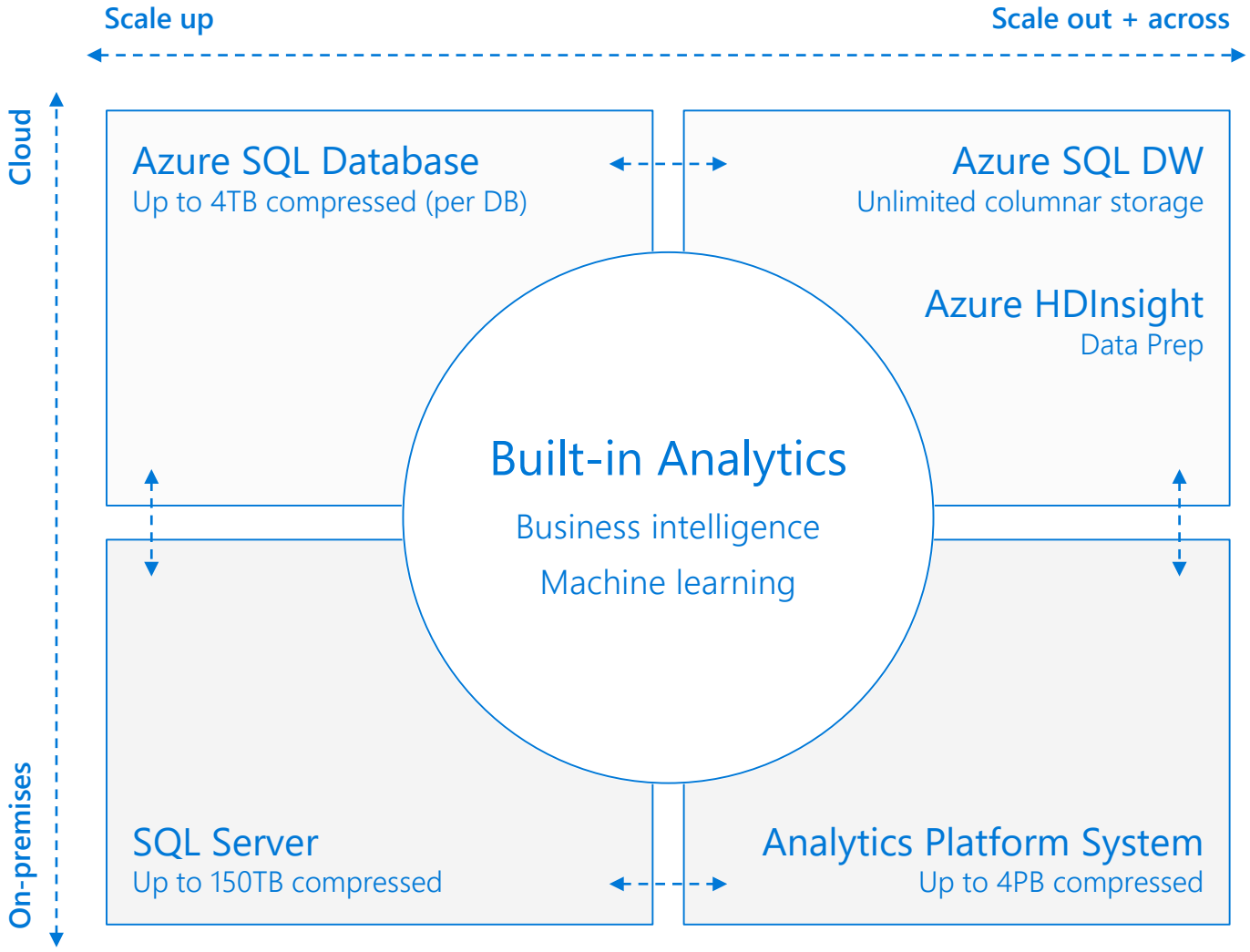
Pay for what you need, when you need it with dynamic pause

A fully managed Platform-as-a-Service

- Azure cloud data warehouse service
- Elastic scale
- Separate storage and compute
- Use existing tools and skills
- Deploy and use in minutes!



WHEN TO USE WHAT



AZURE SQL DATA WAREHOUSE - PERFORMANCE TIERS

Optimized for elasticity

Elastic-scale performance tier provides high performance for regular workloads and analytics

NEW!

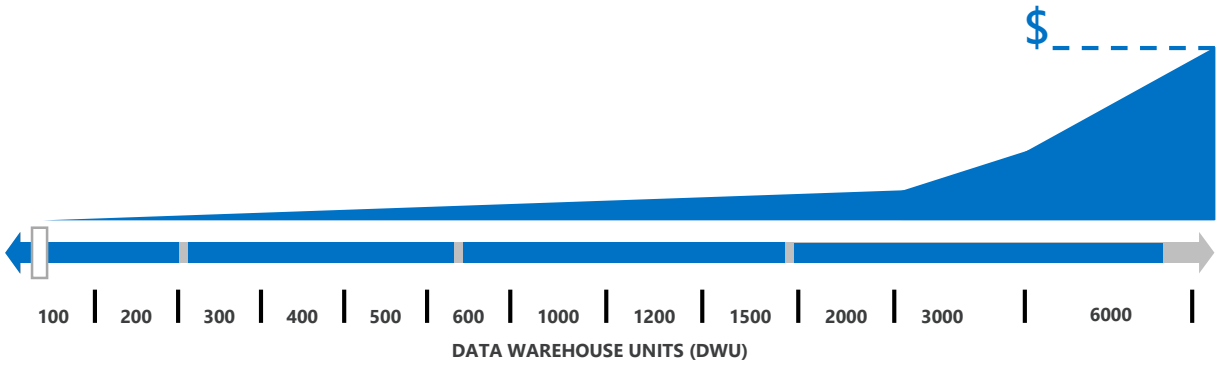
Optimized for compute

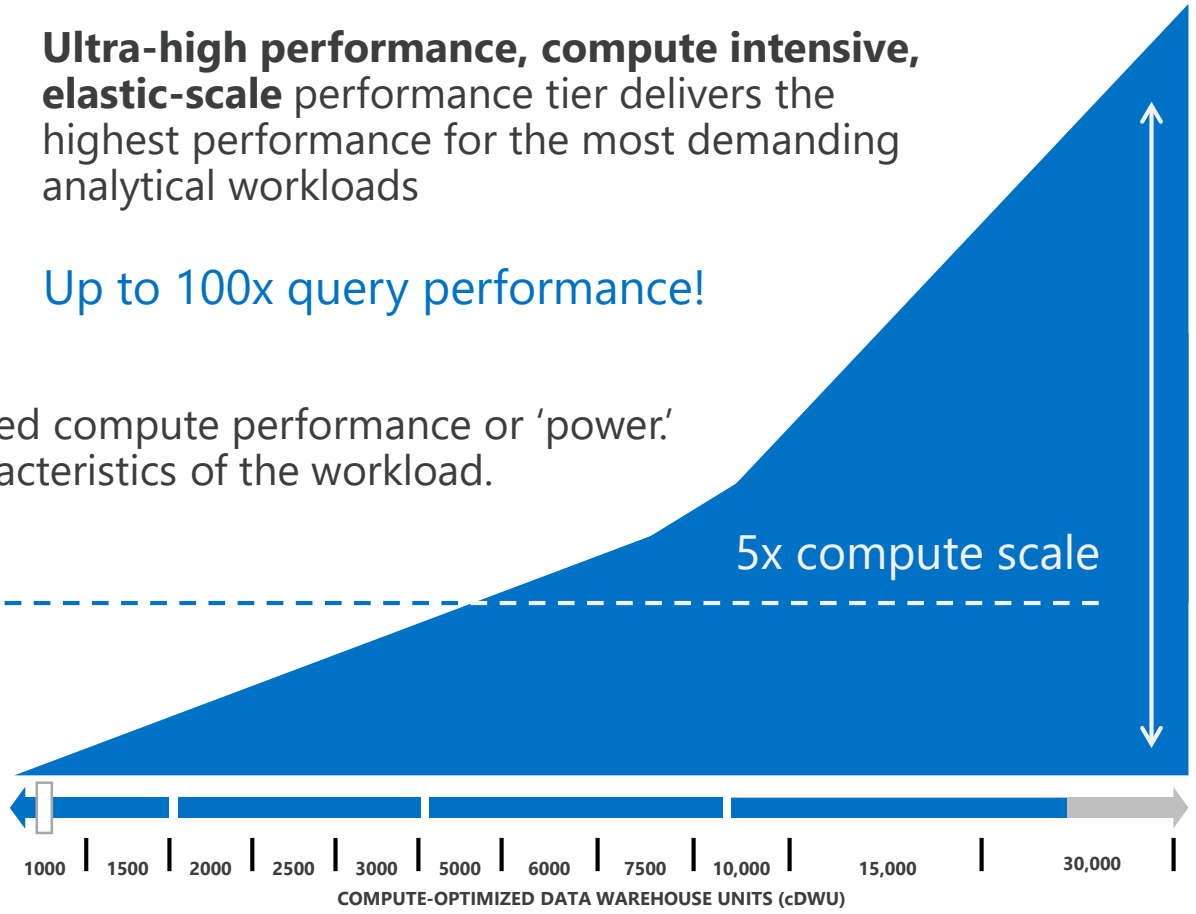
Preview available now!

Ultra-high performance, compute intensive, elastic-scale performance tier delivers the highest performance for the most demanding analytical workloads

Up to 100x query performance!

Data Warehouse Units (DWUs & cDWUs) are a measure of reserved compute performance or 'power.' A customer's DWU or cDWU needs can vary depending on the characteristics of the workload.





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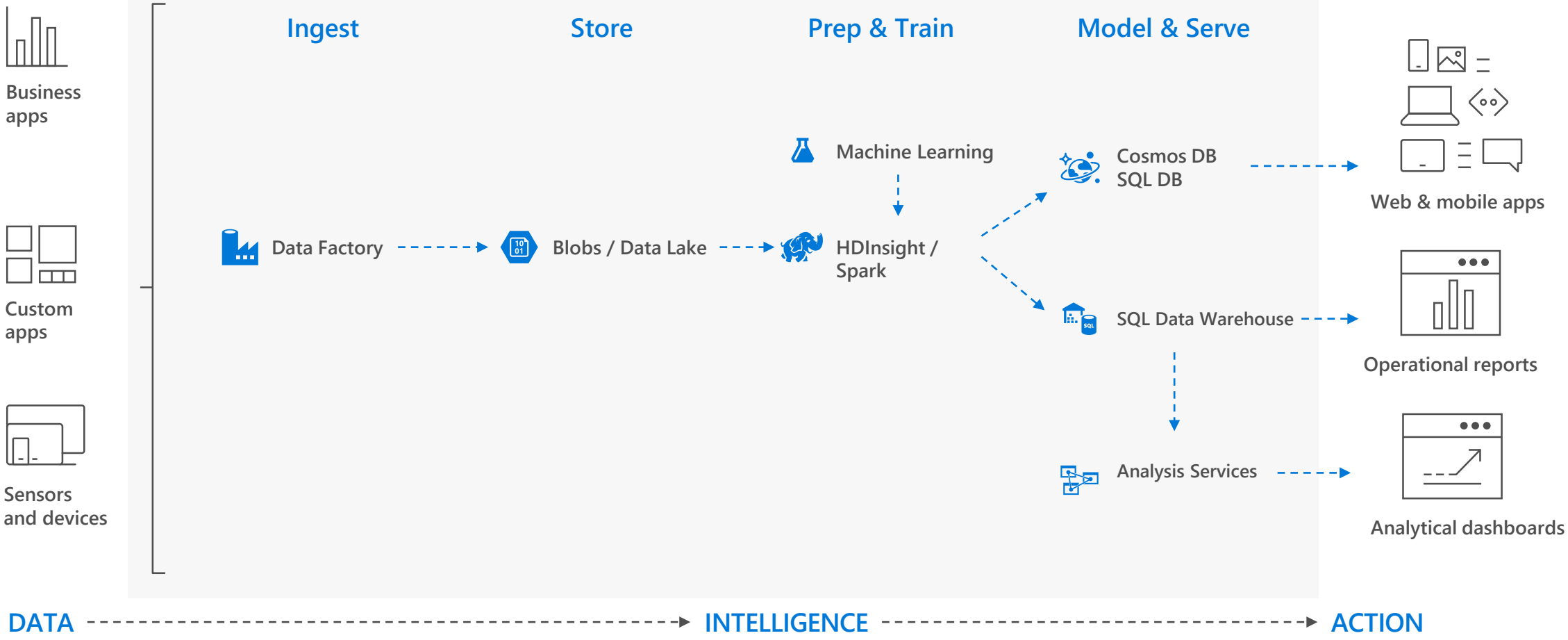
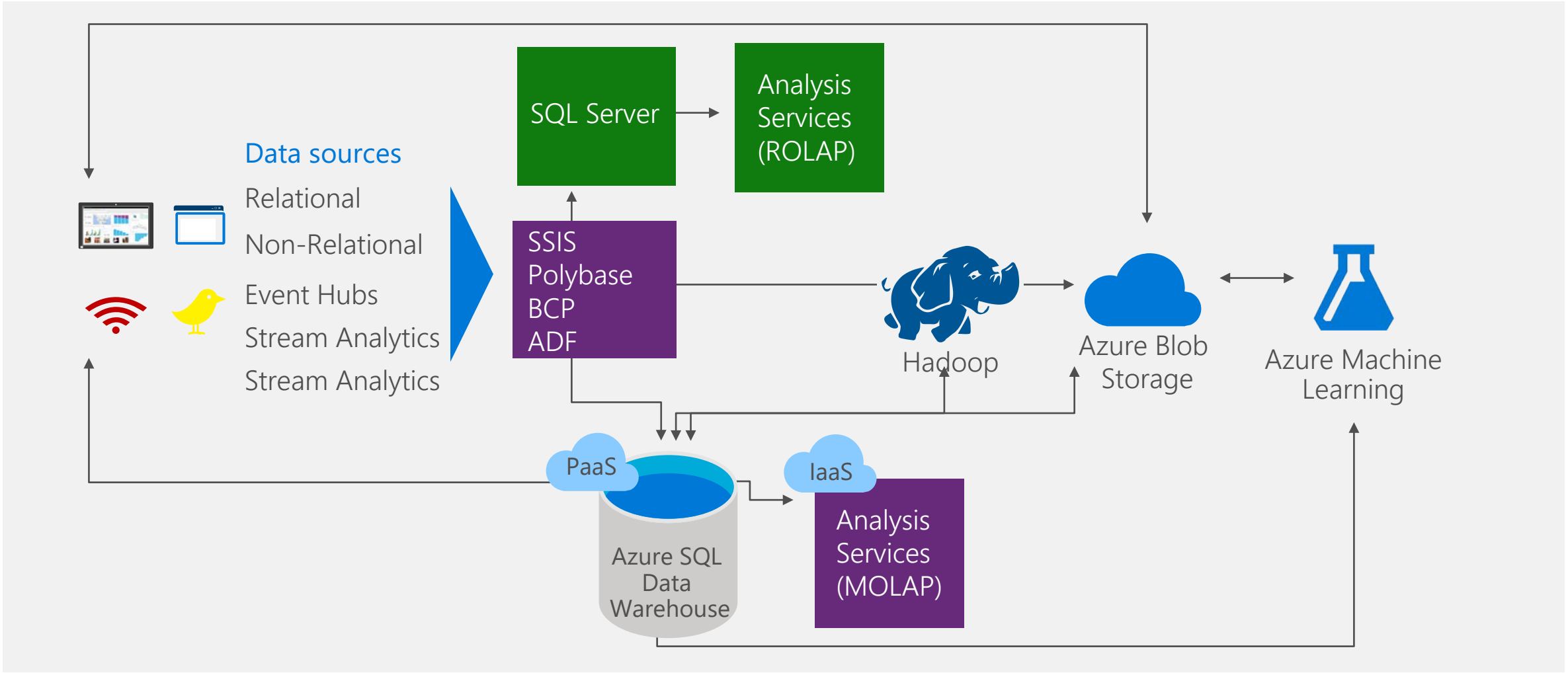
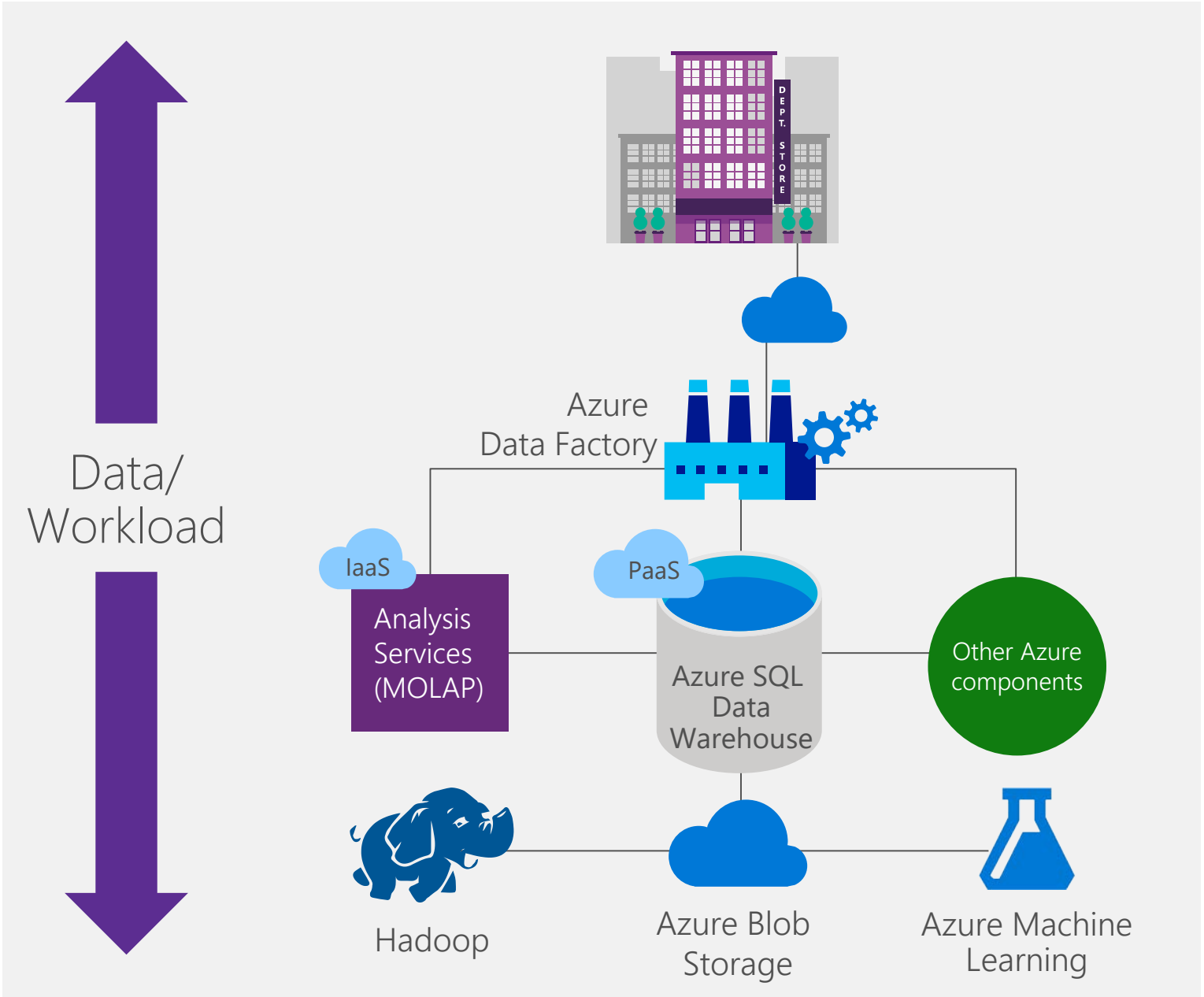


Integrates with existing processes

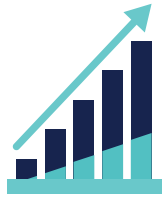


Supports data ingestion from literally anywhere…



Technical capabilities

Industry's **first** enterprise-class cloud data warehouse that can **grow, shrink, and pause** in seconds

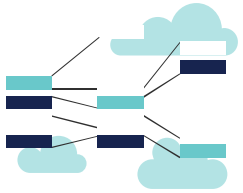


Petabyte scale data warehousing leveraging massive parallel processing

Full enterprise-class SQL Server experience

Two performance tiers designed for businesses of all sizes

Seamless compatibility with Power BI, Azure Machine Learning, HDInsight, and Azure Data Factory



Query and load big data from Hadoop, HDInsight, Data Lake and Blob Storage using Polybase

The Microsoft Data Platform delivers everywhere

BI AND ANALYTICS

Self-service

Corporate

Collaboration

Mobile

Predictive

DATA ENRICHMENT AND FEDERATED QUERY

Single query model

Extract, transform, load

Data quality

Master data management

DATA MANAGEMENT AND PROCESSING

Relational

Non-relational

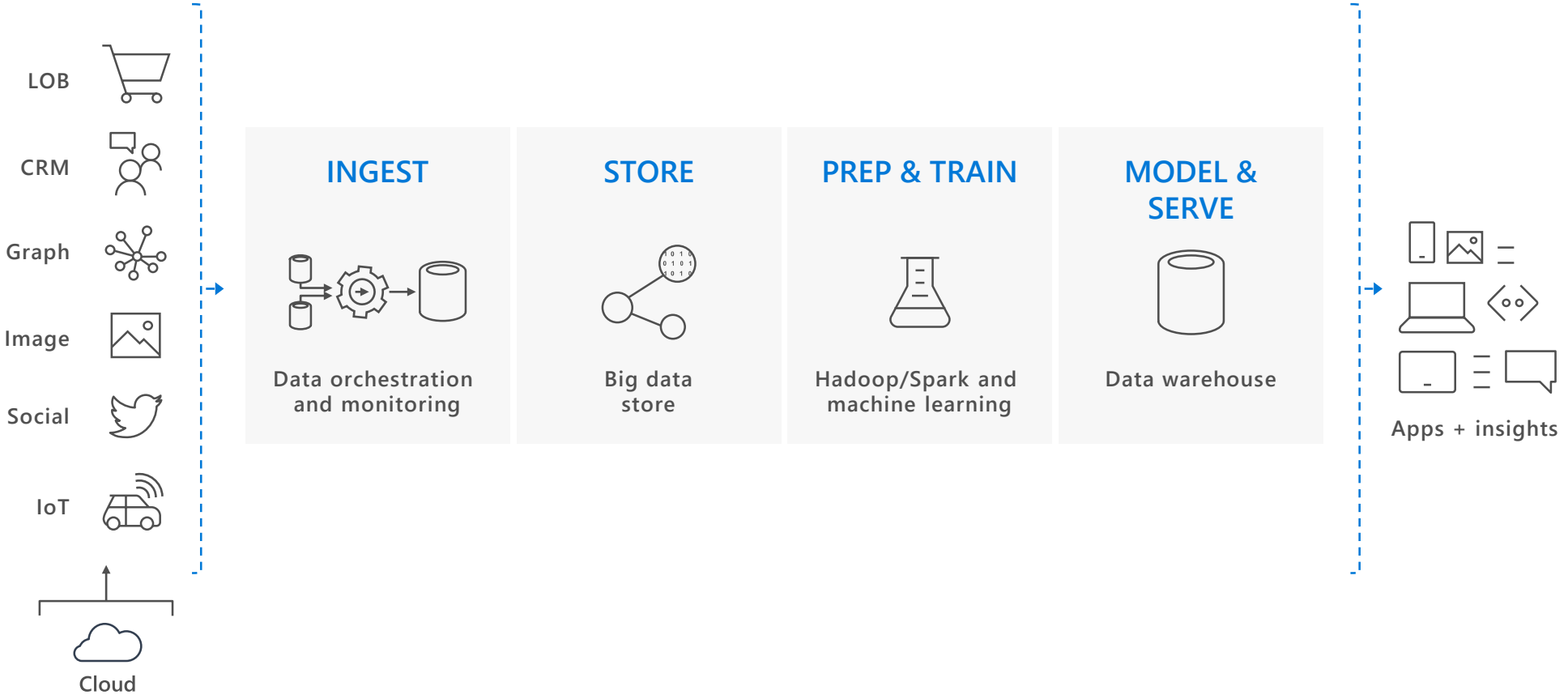
Analytical

Streaming

Internal & external

EVOLUTION OF THE DATA WAREHOUSE

Increasing data volumes. New data sources and types. Big Data + DW workloads

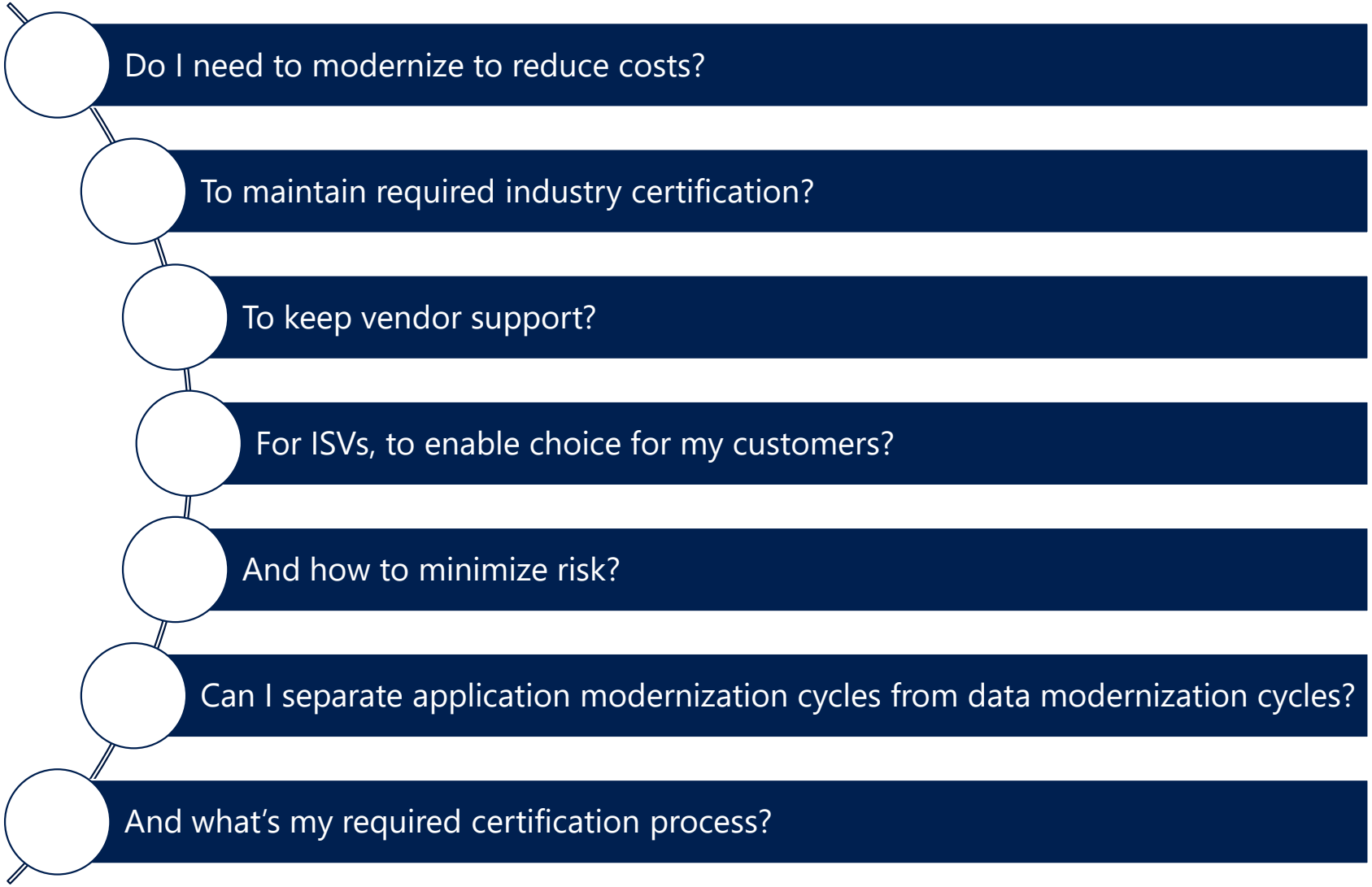


Microsoft

SQL Server Upgrades Done the Right Way

Why upgrade?

Is it the right time to modernize?



Winter is coming…

~45%+ customers still use SQL Server 2008R2 or older.

Database Compatibility Level based certification

Stop certifying for any given platform (Cloud, on-prem)!

Stop certifying for a named SQL Server version!

Any certification process should be thought in terms of "*which target database compatibility level am I certifying to?*"

Updated public documentation: http://aka.ms/dbcompat

Microsoft stands by DB Compat based certification

Microsoft Database Compatibility Level Protection

Full Functional protection once assessment tools runs clean with no errors.

Query Plan shape protection on comparable hardware.

Maintaining backward compatibility is very important to SQL Server team.

Key Benefits

Simplified application certification on-premise and Azure (e.g. Azure SQL DB MI).

Ability to provide customer a choice of latest SQL Server platform based on certified DB compat level.

Improved risk management by decoupling application upgrade cycles from Database upgrade cycles.

Upgrade Process

Upgrade Strategies

Side-by-side

- Allows for upgrade of OS
- Easier testing
- Easier rollback strategy
- Less downtime

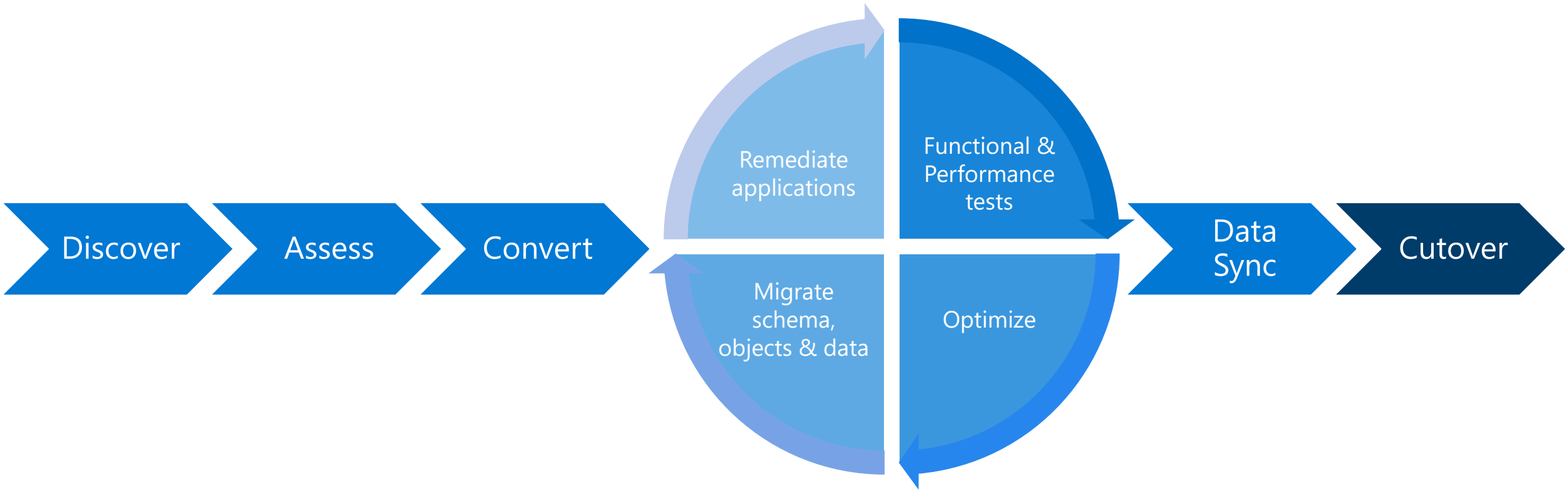
In-place

- Doesn’t require additional hardware
- No data migration required

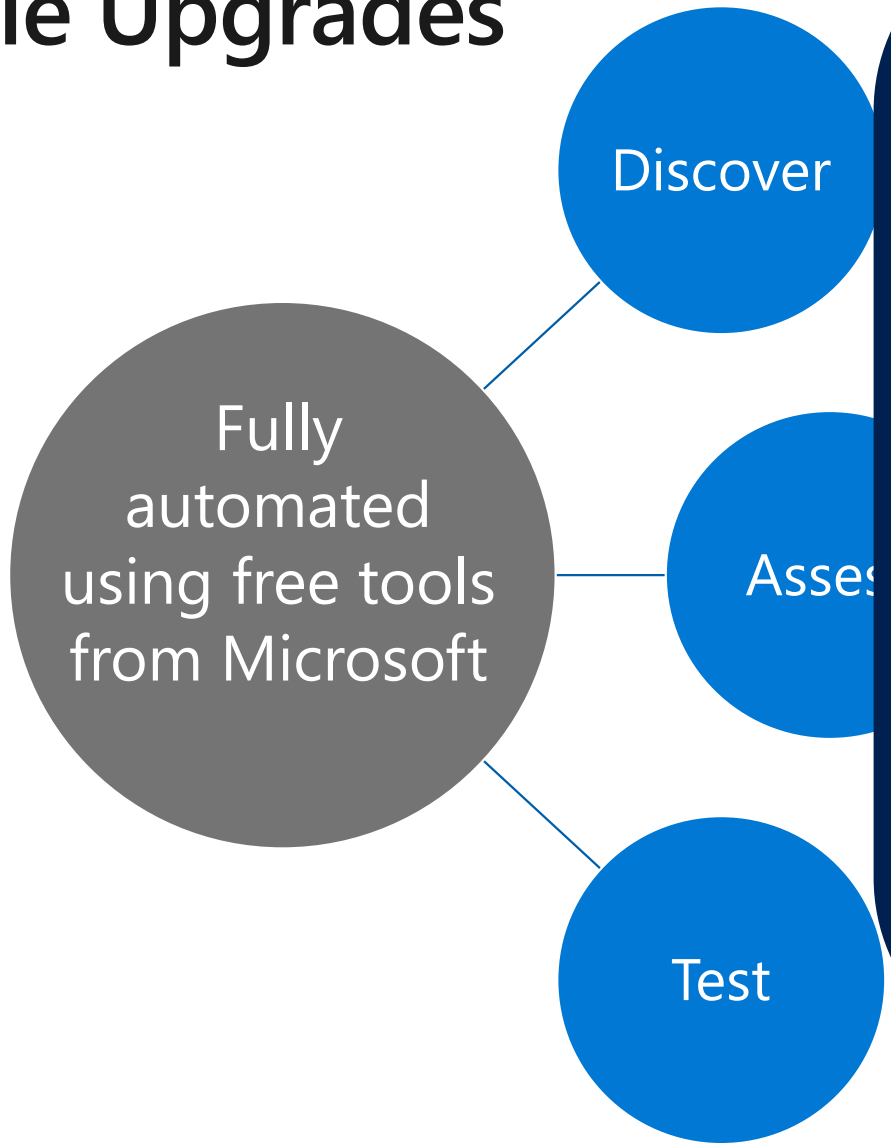
Traditional Upgrade Strategies

Feature	Notes
Log Shipping	Cutover measured in (typically) minutes
Replication	Cutover measured in (potentially) seconds
Backup and Restore	This is going to take a while!
Filesystem/SAN Copy	Ditto - the latter being significantly faster
Availability Groups (NOT available in < 2012)	Cutover measured in (typically) seconds

Minimize Risk with the Database Migration Guide



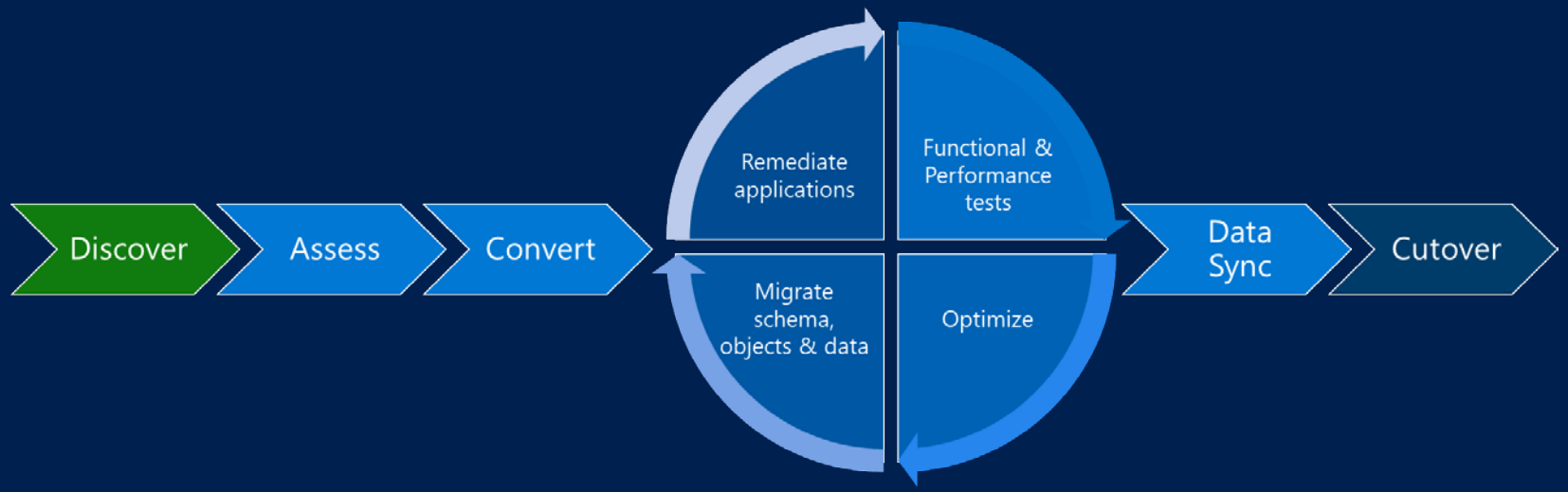
Reliable Upgrades



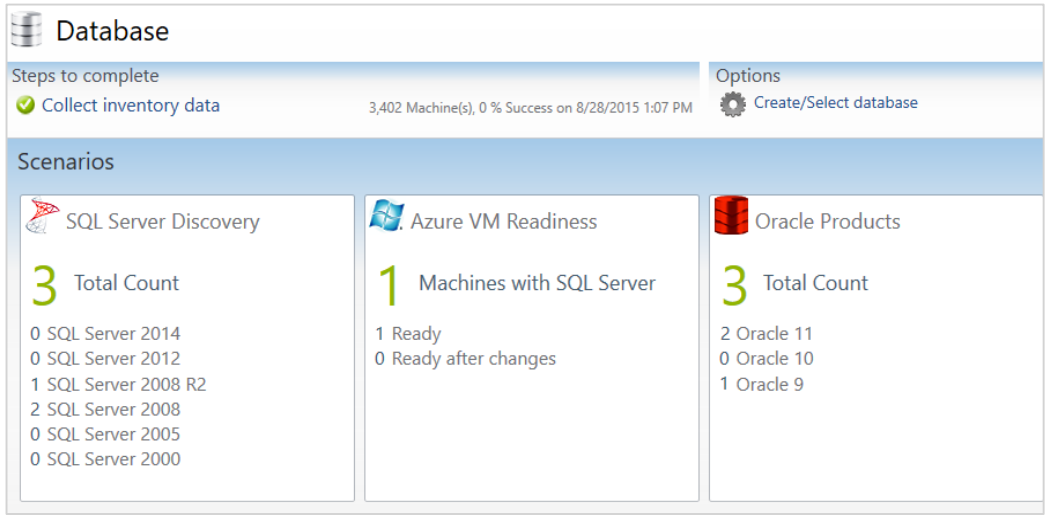
"With tools like Database Migration Assistant and Database Experimentation Assistant, we were able to reduce the time and effort required for the upgrade, enable automated A/B testing capability to minimize risk and provide a high confidence upgrade plan for a mission critical, Tier-1 environment spanning over a 1000 instances of SQL Server within 3 months."

Salesforce – PASS Summit 2017

Discover

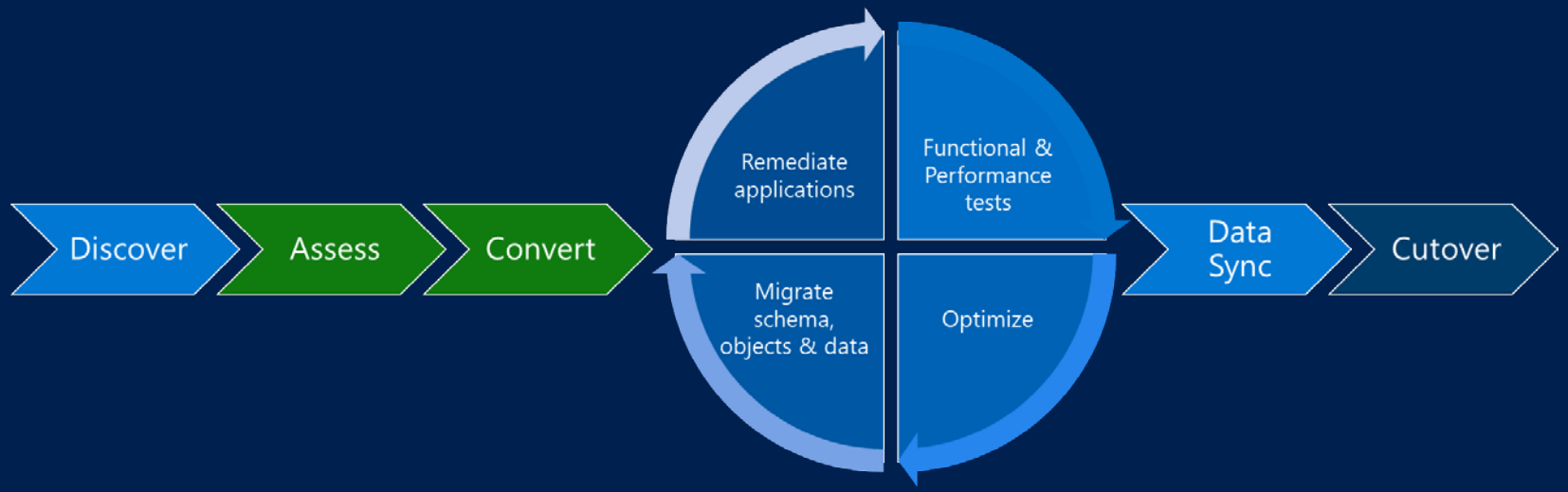

Discover
Assess
Convert
Remediate applications
Functional & Performance tests
Migrate schema, objects & data
Optimize
Data Sync
Cutover

Discover with MAP Toolkit

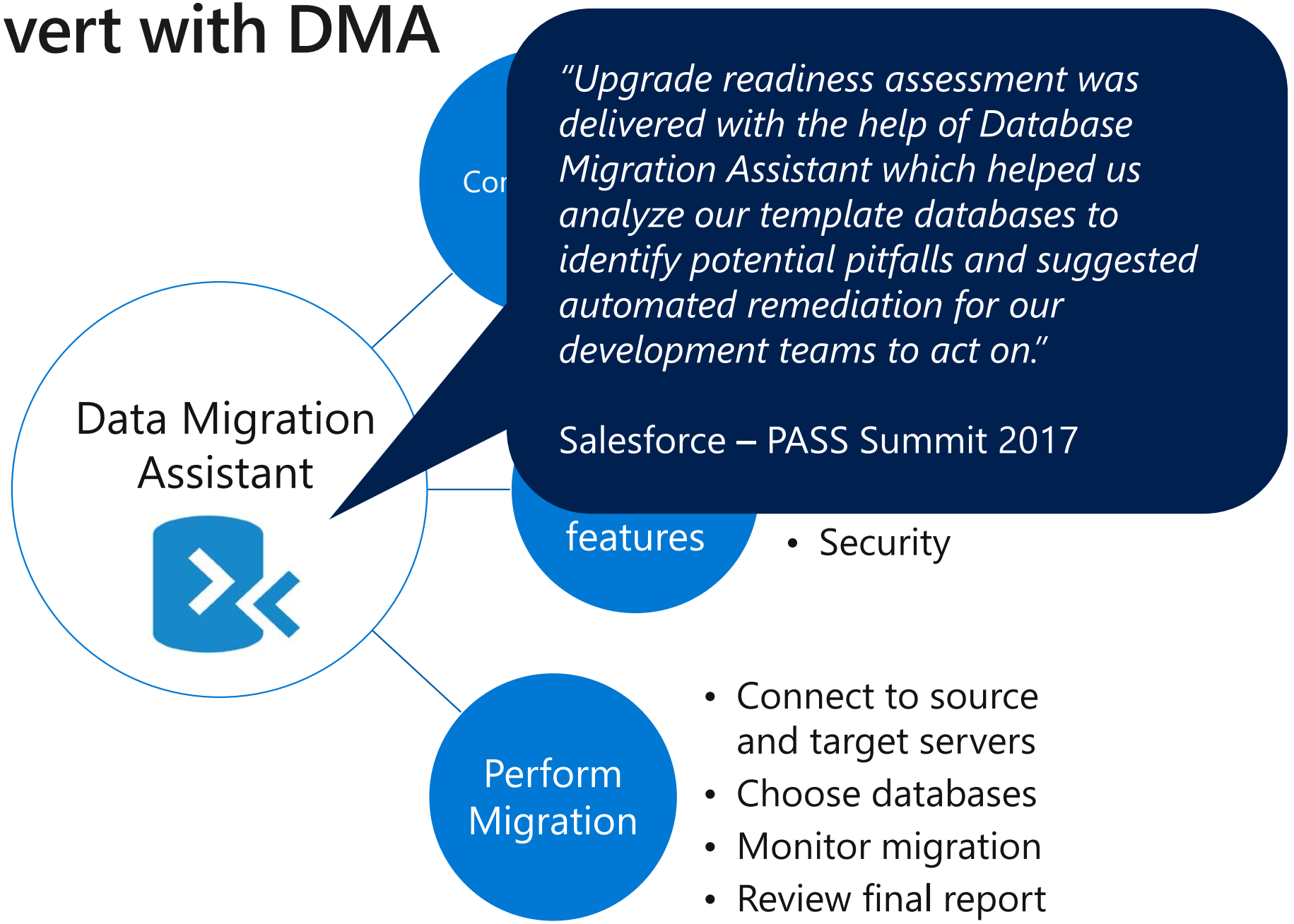


- Which SQL Server versions do I have?
- Which Editions am I running?
- Which SQL Server components are installed?
- How many cores are on each server?
- How many databases are in each instance?
- What are the sizes of all my databases?
- What are the settings for each instance and database?

Assess & Convert



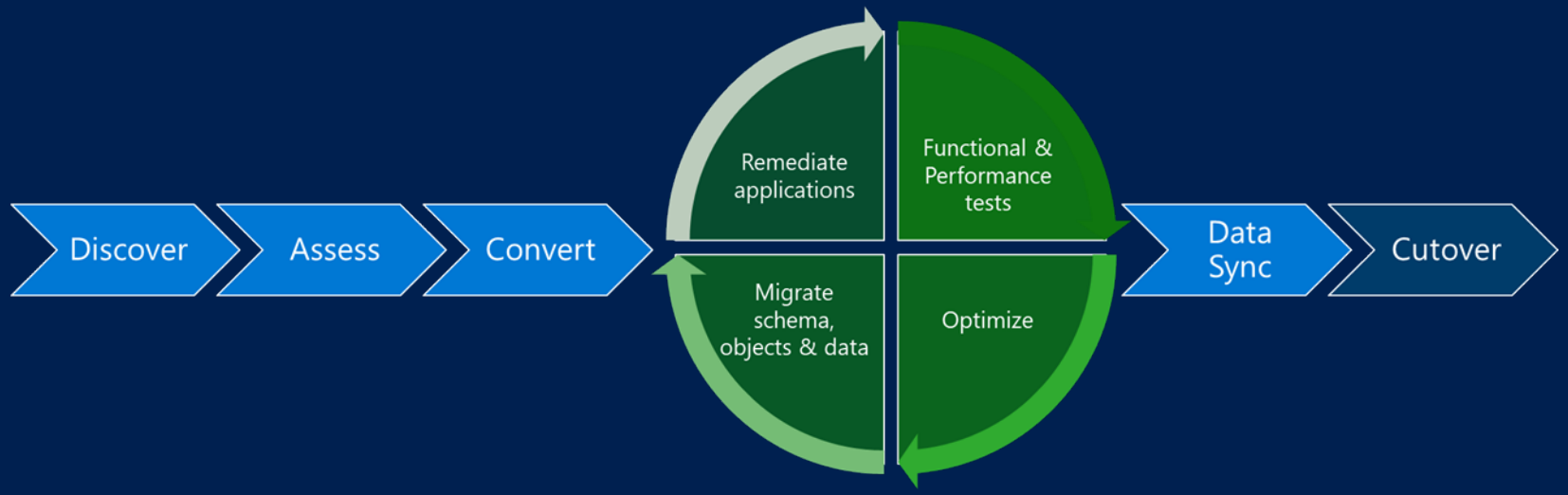
Assess & Convert with DMA



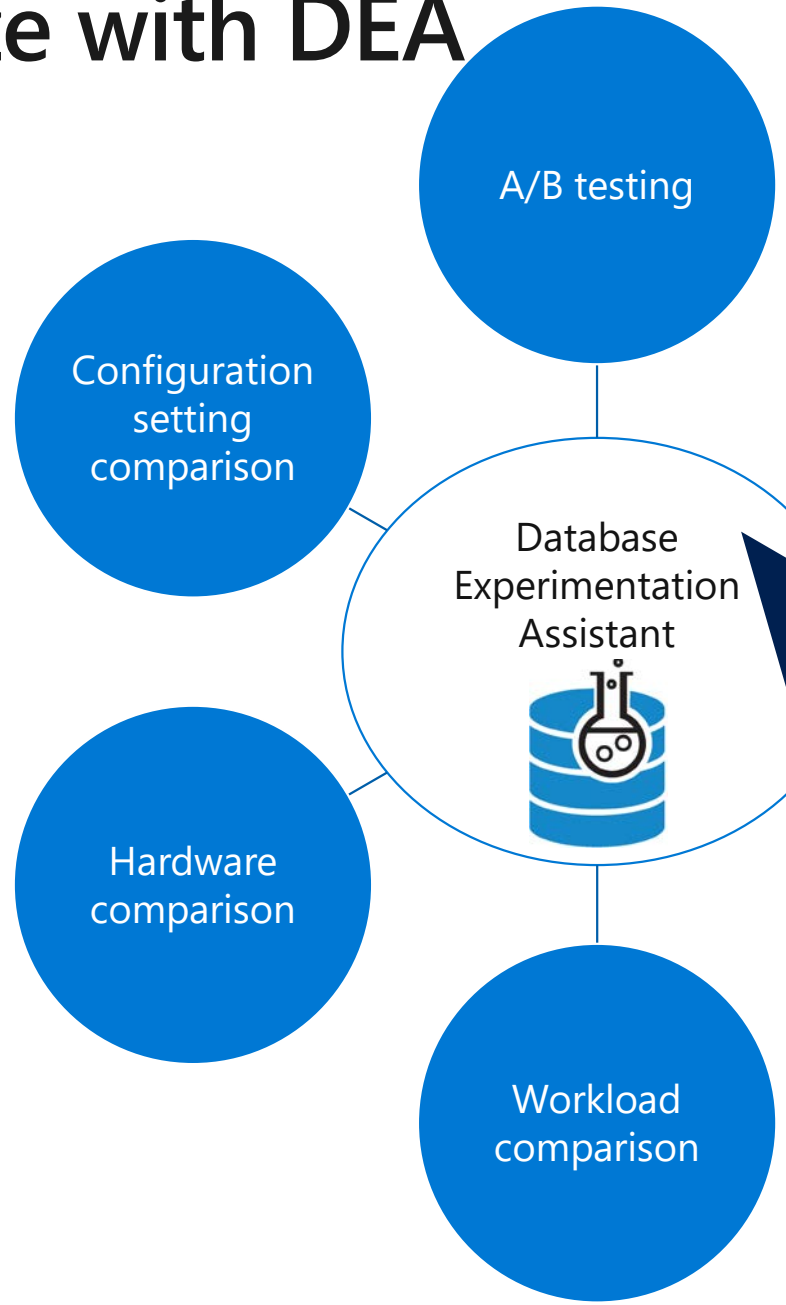
"Upgrade readiness assessment was delivered with the help of Database Migration Assistant which helped us analyze our template databases to identify potential pitfalls and suggested automated remediation for our development teams to act on."

Salesforce – PASS Summit 2017

Test & Optimize



Test & Optimize with DEA



"Database Experimentation Assistant helped us perform comparison tests between our current environment and a test SQL Server 2016 environment to identify regressions, breaking changes and performance characteristics. Because of the automation, we were able to repeat such an exercise with multiple iterations using different configuration settings."

Salesforce – PASS Summit 2017

Database Migration Assistant

Database Experimentation Assistant

Database Experimentation Assistant

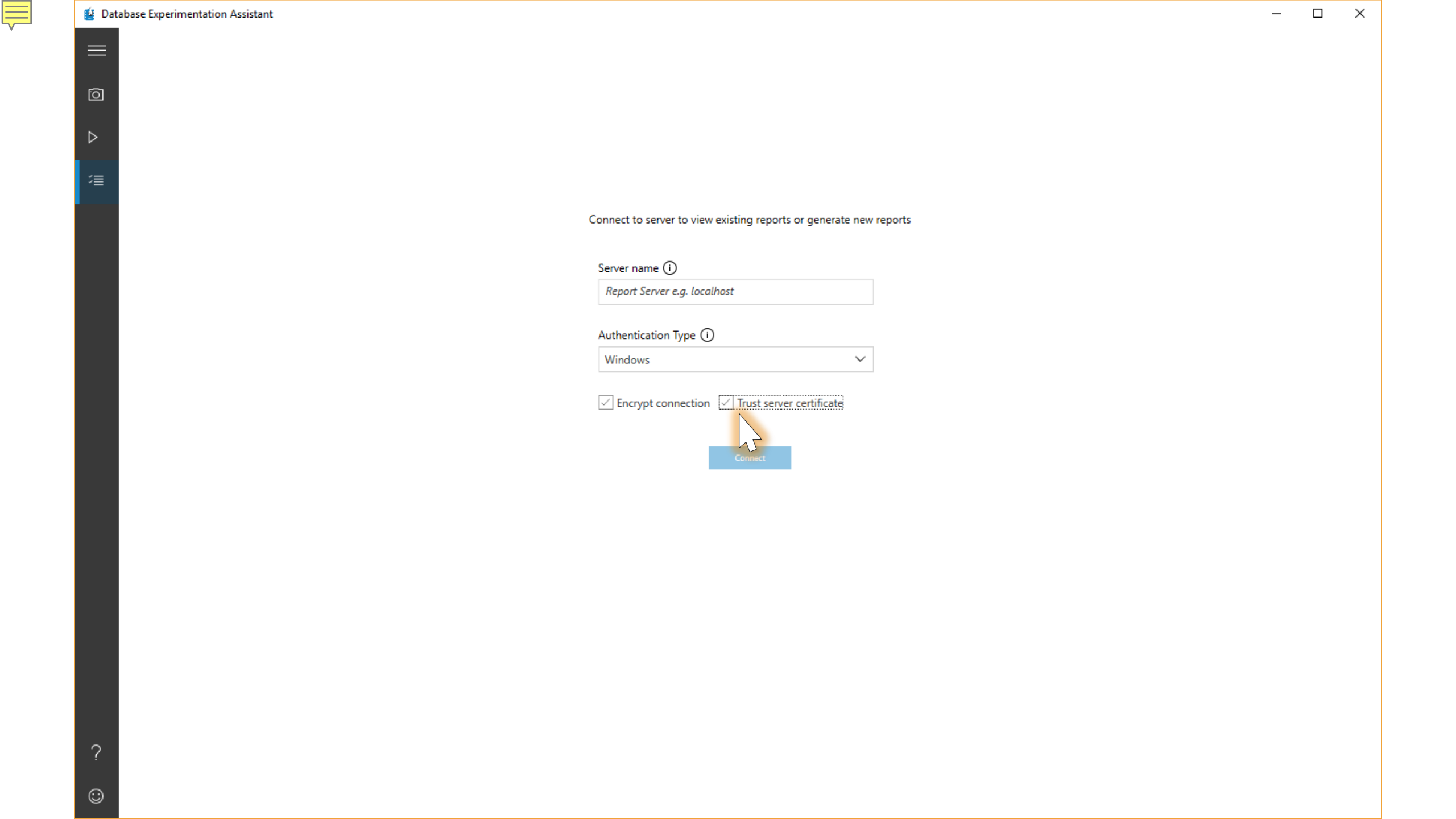
Welcome to Database Experimentation Assistant

To get started, click on the left side navigation bar.

Capture a workload on the source server.

Replay the captured workload on target 1 and target 2.

Analyze replayed traces collected from target 1 and target 2.


Database Experimentation Assistant
Connect to server to view existing reports or generate new reports
Server name
Report Server e.g. localhost
Authentication Type
Windows
Encrypt connection
Trust server certificate
Connect

Database Experimentation Assistant

Analysis Reports

Connected Report Server: DEAGAWSVR2016 Switch Server

+ NEW REPORT

STATUS	NAME	DATE
✓	Test08To14Sma	2018/07/18
✓	ADWTPS100	2018/07/18
✓	2016Migration	2018/03/13

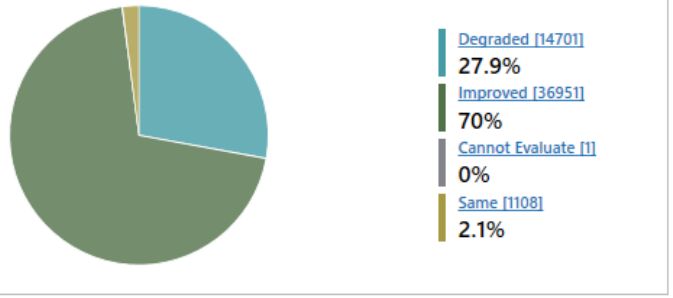
2016Migration

Threshold 5% Export Print

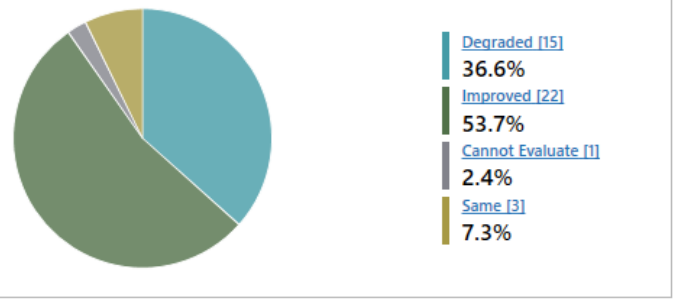
Target	Instance Name	Product Name	Trace File
Target 1	SQL2008SOURCE	SQL Server 2008 SP4 MS15-059	C:\Users\moljain\Documents\sql\2008-small\Trace.trc
Target 2	SQL2016TRACE	SQL Server 2016	C:\Users\moljain\Documents\sql\2016-small\Trace.trc

QUERY DISTRIBUTION

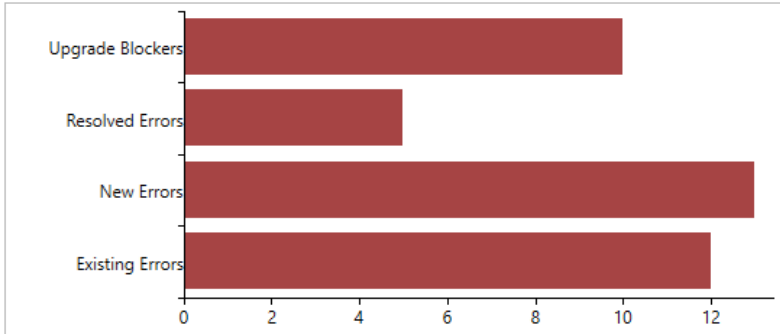
By execution count



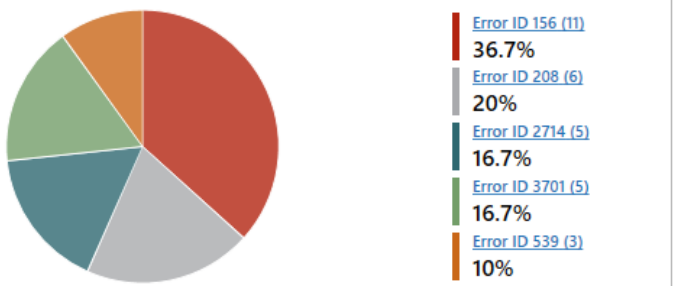
By distinct queries



Distinct error queries count by type



Error ID count



Top queries in workload

Top Improved Queries | Top Degraded Queries

Hash Id	Query Text	Mean Duration on Target 1 (µs)	Mean Duration on Target 2 (µs)	Duration Difference (µs)
-1616155278339986948	IF OBJECT_ID ({STR}, {STR}) IS NOT NULL DROP TABLE DBO.EMPLOYEEONE;	102353	9105	-93248
-1704013646769530258	SELECT DISTINCT PP.LASTNAME, PP.FIRSTNAME FROM PERSON.PERSON PP JOIN	181508	127802	-53706

Database Experimentation Assistant

Analysis Reports

Connected Report Server: DEAGAWSVR2016 [Switch Server]

+ NEW REPORT

STATUS	NAME	DATE
✓	Test08To14Sma	2018/07/18
✓	ADWTPS100	2018/07/18
✓	2016Migration	2018/03/13

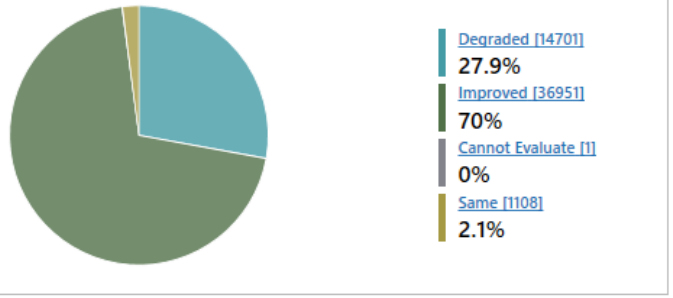
2016Migration

Threshold 5% | Export | Print

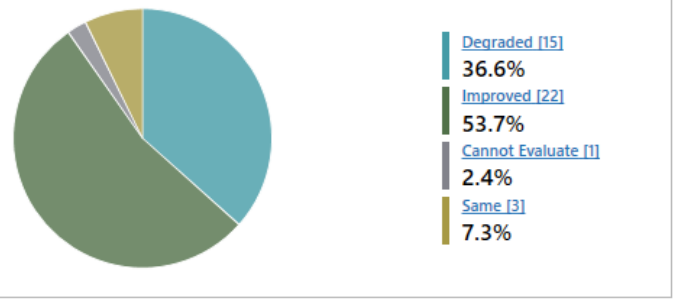
Target	Instance Name	Product Name	Trace File
Target 1	SQL2008SOURCE	SQL Server 2008 SP4 MS15-059	C:\Users\moljain\Documents\sql\2008-small\Trace.trc
Target 2	SQL2016TRACE	SQL Server 2016	C:\Users\moljain\Documents\sql\2016-small\Trace.trc

QUERY DISTRIBUTION

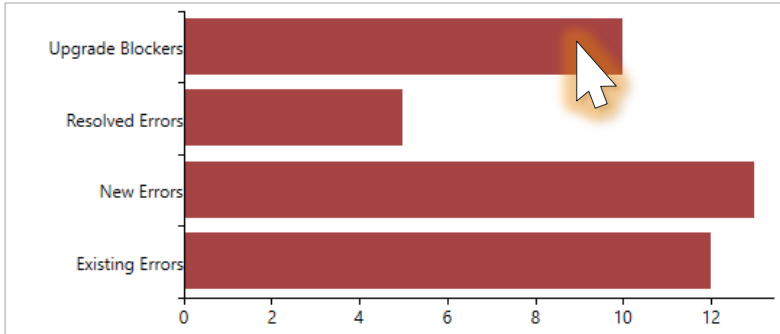
By execution count



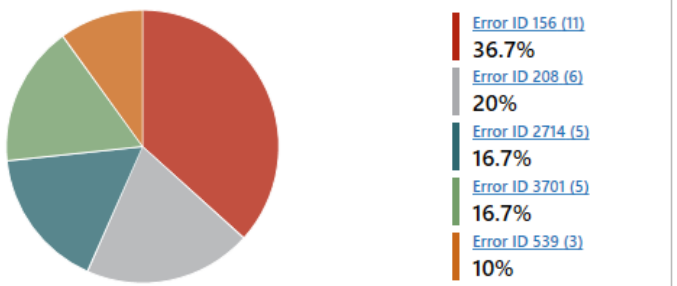
By distinct queries



Distinct error queries count by type



Error ID count



Top queries in workload

Top Improved Queries | Top Degraded Queries

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-1616155278339986948	IF OBJECT_ID ({STR}, {STR}) IS NOT NULL DROP TABLE DBO.EMPLOYEEONE;	102353	9105	-93248
-1704013646769530258	SELECT DISTINCT PP.LASTNAME, PP.FIRSTNAME FROM PERSON.PERSON PP JOIN	181508	127802	-53706

Database Experimentation Assistant

Analysis Reports

Connected Report Server: DEAGAWSVR2016 [Switch Server]

+ NEW REPORT

STATUS	NAME	DATE
✓	Test08To14Sma	2018/07/18
✓	ADWTPS100	2018/07/18
✓	2016Migration	2018/03/13

2016Migration > Error

Threshold 5% | Export | Print

Target	Instance Name	Product Name	Trace File
Target 1	SQL2008SOURCE	SQL Server 2008 SP4 MS15-059	C:\Users\moljain\Documents\sql20008-small\Trace.trc
Target 2	SQL2016TRACE	SQL Server 2016	C:\Users\moljain\Documents\sql2016-small\Trace.trc

ERROR QUERIES

Error Type	Query Count	Execution Count
Existing Errors (Errors on target 1 server that continue to exist on the target 2 server.)	12	1128
New Errors (Errors which are new on the target 2 server.)	13	3552
Resolved Errors (Errors which existed on target 1 server but resolved in target 2 server.)	5	14
Upgrade Blockers (Errors that will block upgrade to target server.)	10	3519

New Errors | Existing Errors | Resolved Errors | Upgrade Blockers

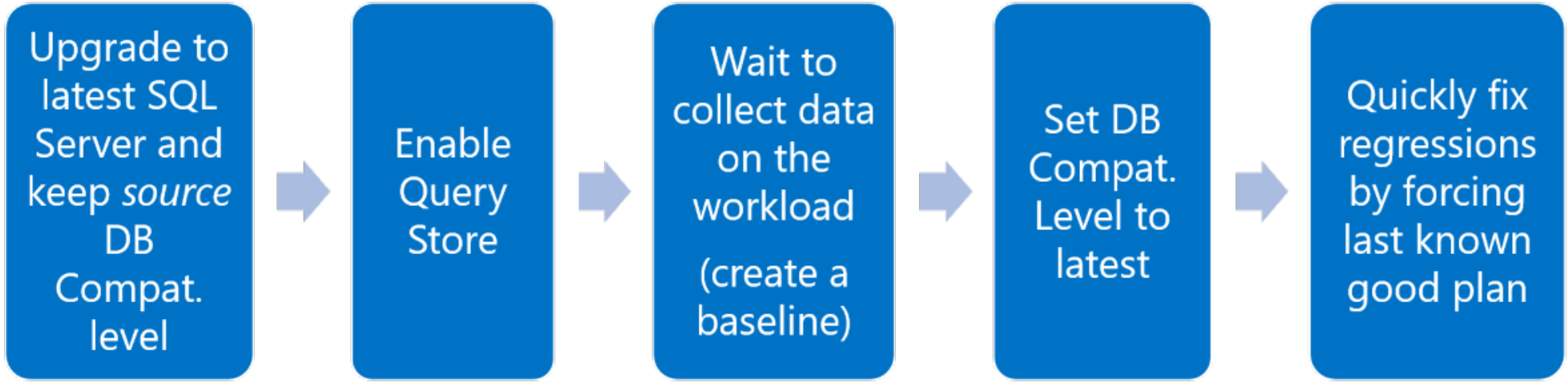
Query Text	Error ID	Error Count	Error Text
SELECT PRODUCTID, LINETOTAL FROM SALES.SALESORDERDETAIL WHERE UNITPRICE < {##}.{##} ORDER BY PRODUCTID, LINETOTAL COMPUTE SUM(LINETOTAL) BY PRODUCTID;	156	372	Incorrect syntax near the keyword 'COMPUTE'.
SELECT PRODUCTID, ORDERQTY, SUM(LINETOTAL) AS TOTAL FROM SALES.SALESORDERDETAIL WHERE UNITPRICE < {##}.{##} GROUP BY PRODUCTID, ORDERQTY ORDER BY PRODUCTID, ORDERQTY COMPUTE SUM(SUM(LINETOTAL)) BY PRODUCTID, ORDERQTY COMPUTE SUM(SUM(LINETOTAL));	156	397	Incorrect syntax near the keyword 'COMPUTE'.
SELECT SALESPERSONID, CUSTOMERID, ORDERDATE, SUBTOTAL, TOTALDUE FROM SALES.SALESORDERHEADER ORDER BY SALESPERSONID, ORDERDATE COMPUTE SUM(SUBTOTAL), SUM (TOTALDUE) BY SALESPERSONID;	156	342	Incorrect syntax near the keyword 'COMPUTE'.
SELECT PRODUCTID, ORDERQTY, LINETOTAL FROM SALES.SALESORDERDETAIL COMPUTE SUM (ORDERQTY), SUM(LINETOTAL);	156	365	Incorrect syntax near the keyword 'COMPUTE'.
SELECT PRODUCTID, ORDERQTY, UNITPRICE, LINETOTAL FROM SALES.SALESORDERDETAIL WHERE UNITPRICE < {##}.{##} COMPUTE SUM(ORDERQTY), SUM(LINETOTAL);	156	327	Incorrect syntax near the keyword 'COMPUTE'.
SELECT PRODUCTID, ORDERQTY, UNITPRICE, LINETOTAL FROM SALES.SALESORDERDETAIL WHERE UNITPRICE < {##}.{##} ORDER BY PRODUCTID, ORDERQTY, LINETOTAL COMPUTE SUM(LINETOTAL) BY PRODUCTID, ORDERQTY COMPUTE SUM(LINETOTAL) BY PRODUCTID;	156	354	Incorrect syntax near the keyword 'COMPUTE'.
SELECT PRODUCTID, LINETOTAL FROM SALES.SALESORDERDETAIL WHERE UNITPRICE < {##}.{##} ORDER BY PRODUCTID, LINETOTAL COMPUTE SUM(LINETOTAL), MAX(LINETOTAL) BY PRODUCTID;	156	375	Incorrect syntax near the keyword 'COMPUTE'.
SELECT PRODUCTID, ORDERQTY, UNITPRICE, LINETOTAL FROM SALES.SALESORDERDETAIL WHERE UNITPRICE < {##}.{##} ORDER BY PRODUCTID COMPUTE SUM(ORDERQTY), SUM(LINETOTAL) BY PRODUCTID COMPUTE SUM(ORDERQTY), SUM(LINETOTAL);	156	323	Incorrect syntax near the keyword 'COMPUTE'.
SELECT CUSTOMERID, ORDERDATE, SUBTOTAL, TOTALDUE FROM SALES.SALESORDERHEADER WHERE	156	331	Incorrect syntax near the keyword 'COMPUTE'

Post-Migration

I moved the data, am I done?

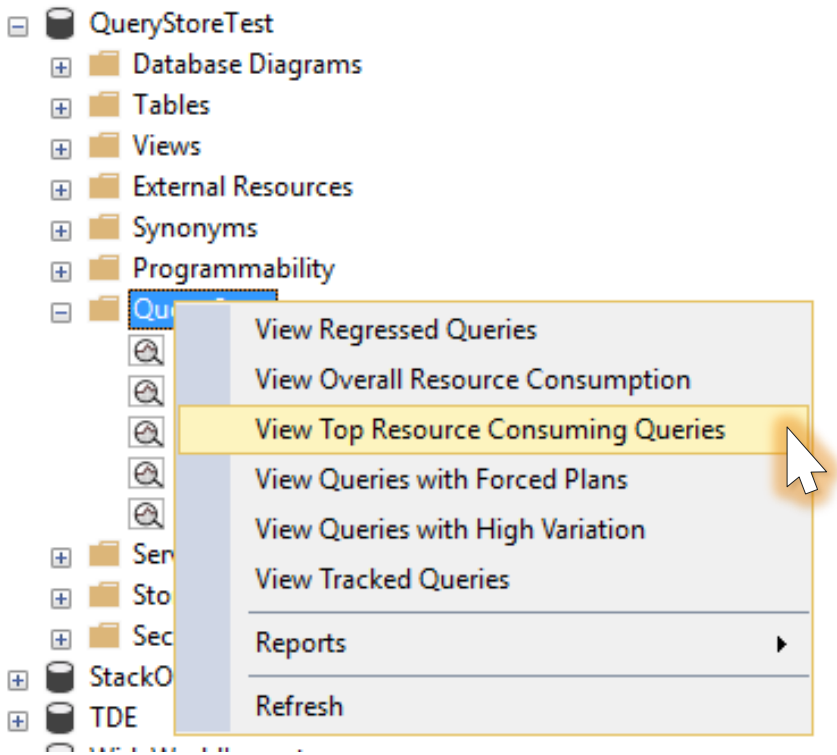
SQL Server post migration step is very crucial for reconciling any data accuracy and completeness, as well as uncover performance issues with the workload.

Recommended Upgrade Plan for latest DB Compatibility Level:

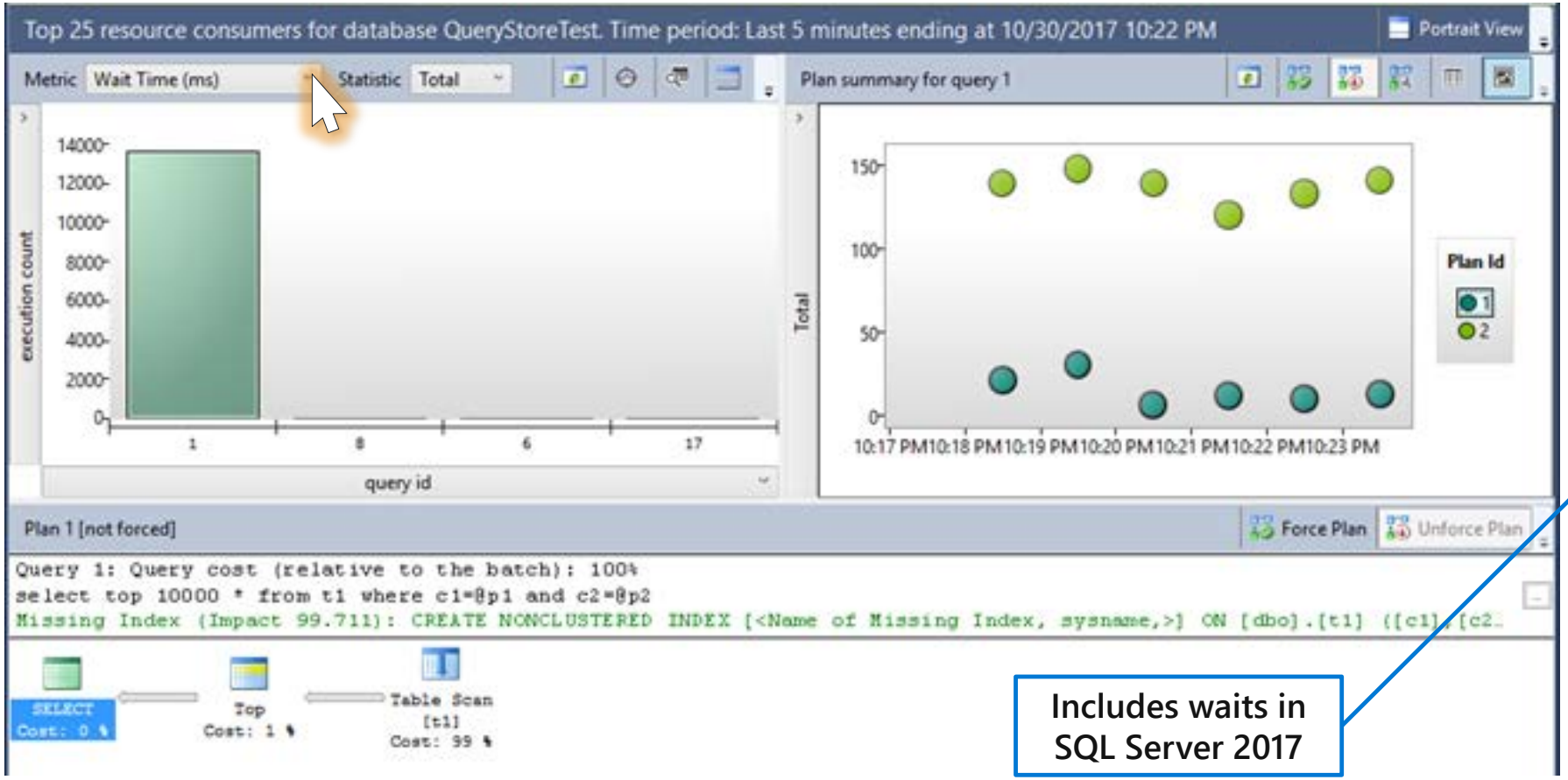


Query Store

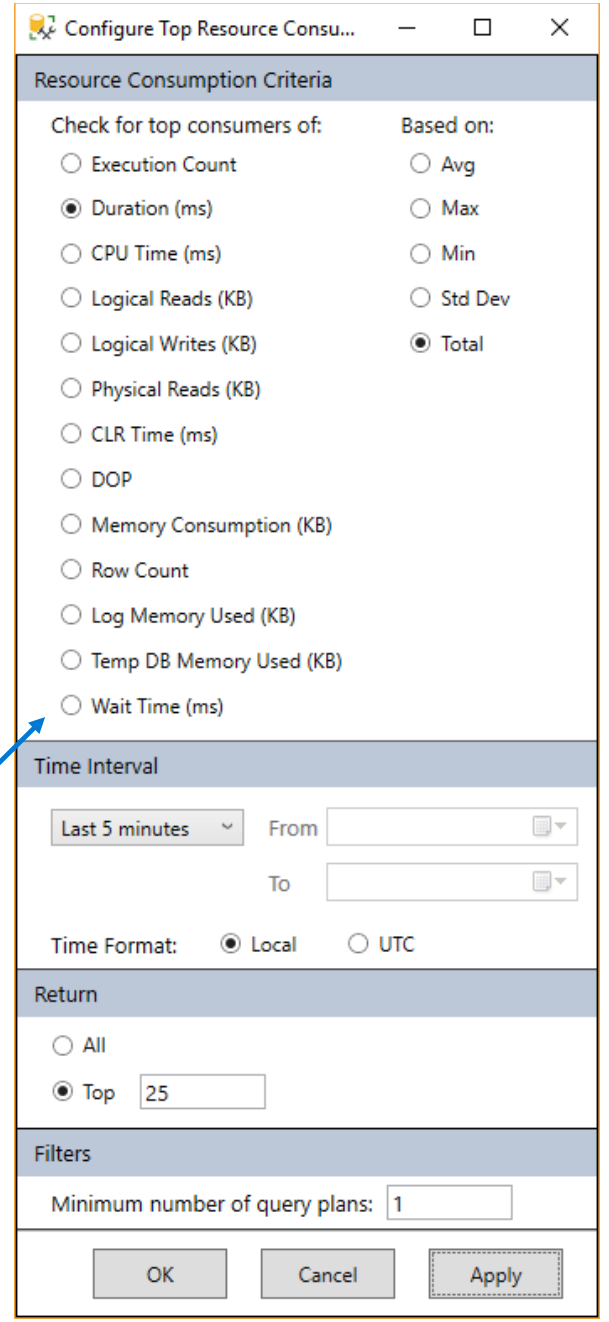
Comprehensive query-performance information when you need it most!



Query Store



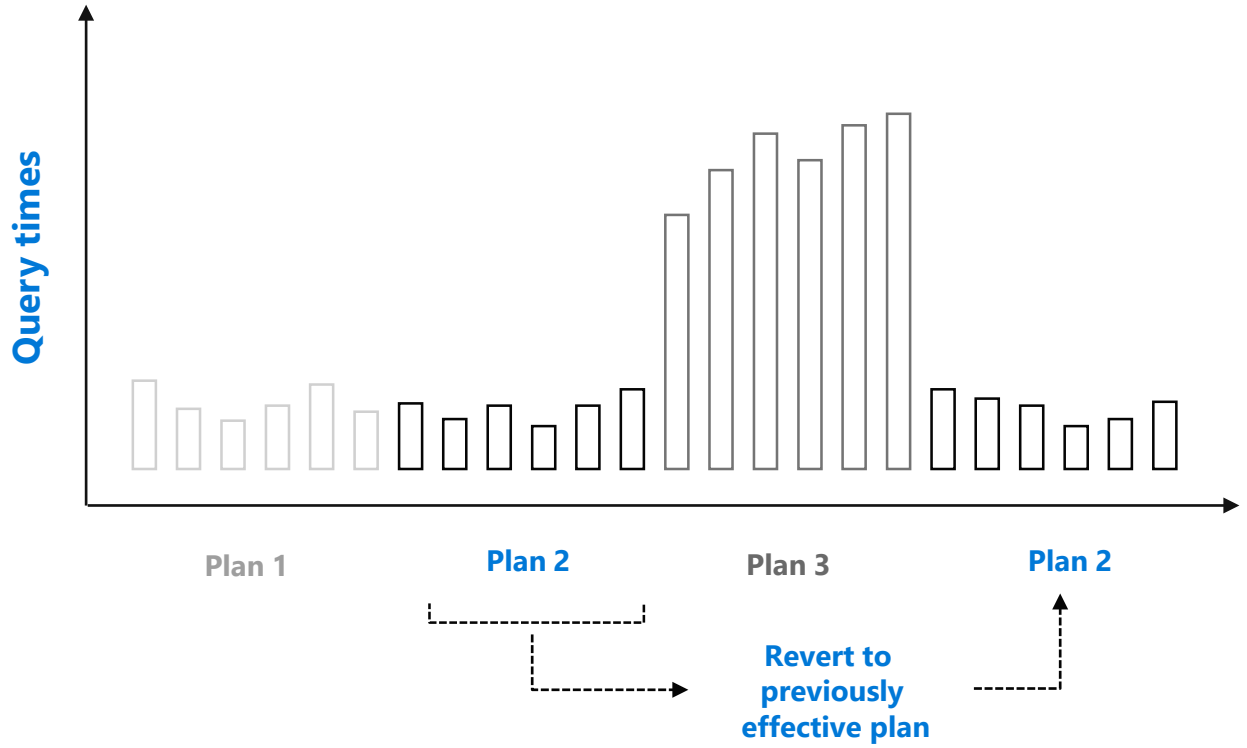
Includes waits in SQL Server 2017



Query Store and Automatic Plan Correction

Identifies the problematic query plan and “fixes” it to be optimal

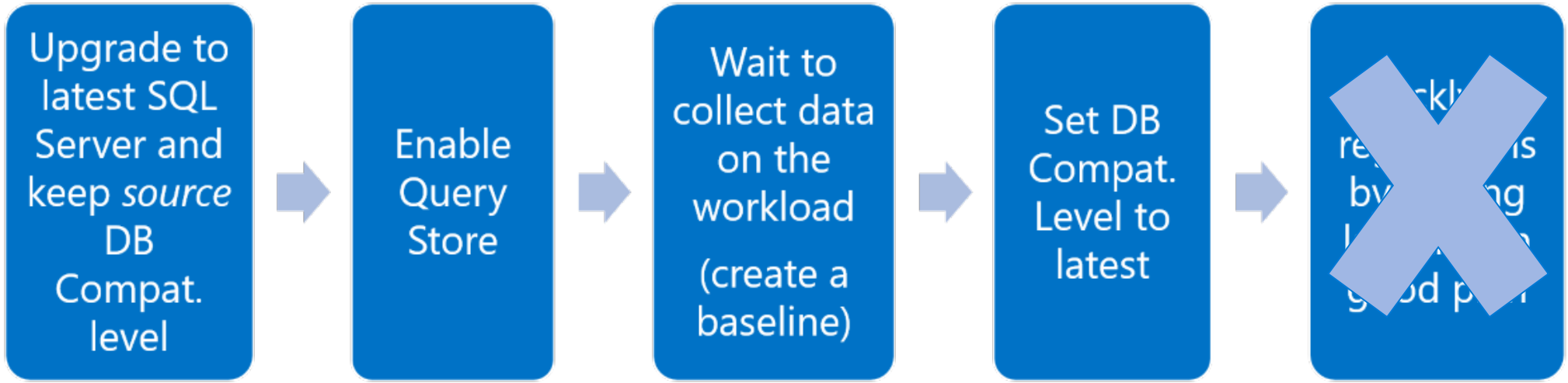
In the scope of a DB Compatibility upgrade, only works if the recommended process was followed



Query Tuning Assistant (QTA)

Crucial to uncover query performance issues with the workload, as it runs on the newer version of SQL Server Database Engine.

User needs to follow documented DB Compatibility upgrade procedure, QTA will guide through steps.



Query Tuning Assistant (QTA)

This first release targets known possible patterns of query regressions due to change in CE version.

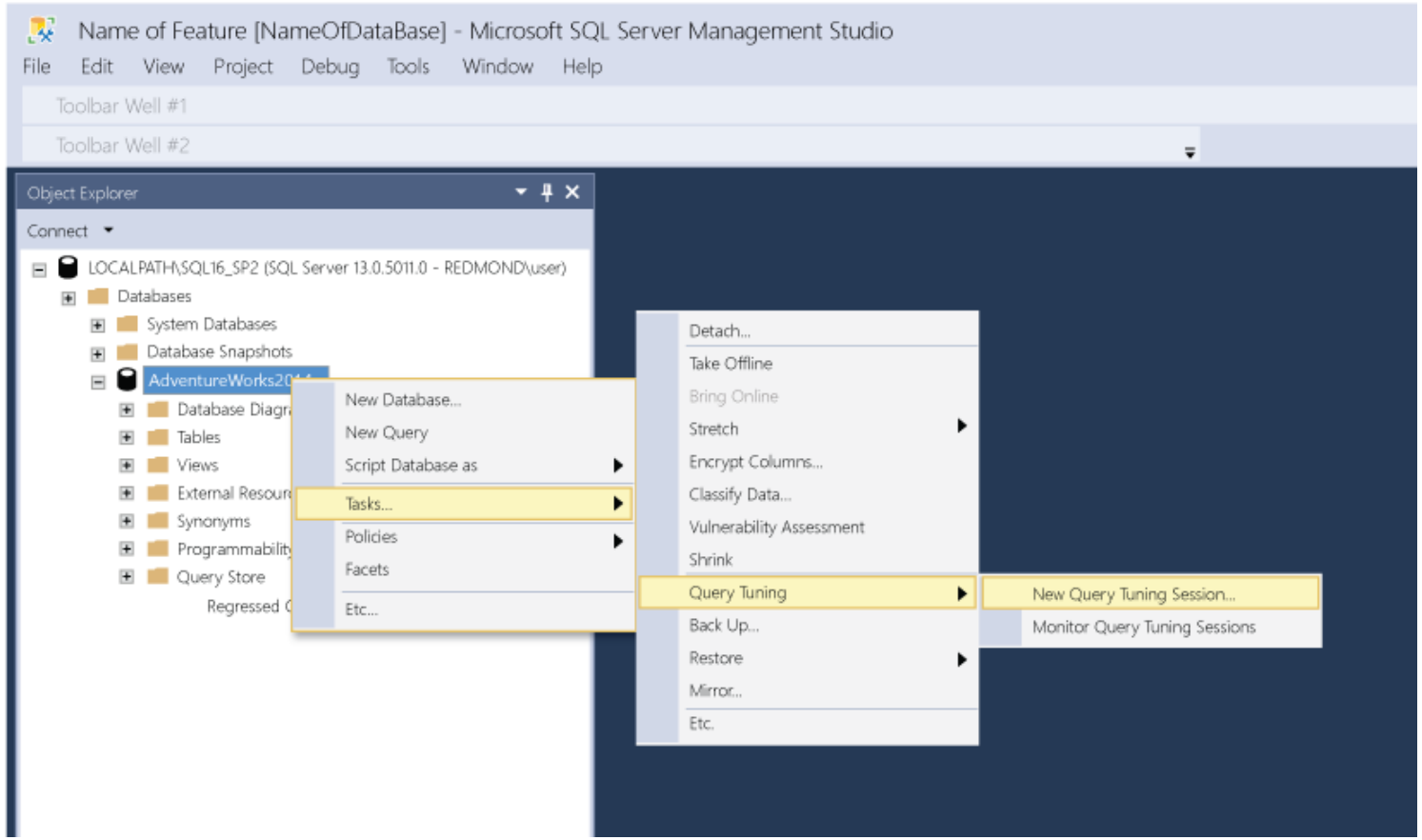
Workflow requires user interaction at well-defined stages, via GUI or PS.

Available as:

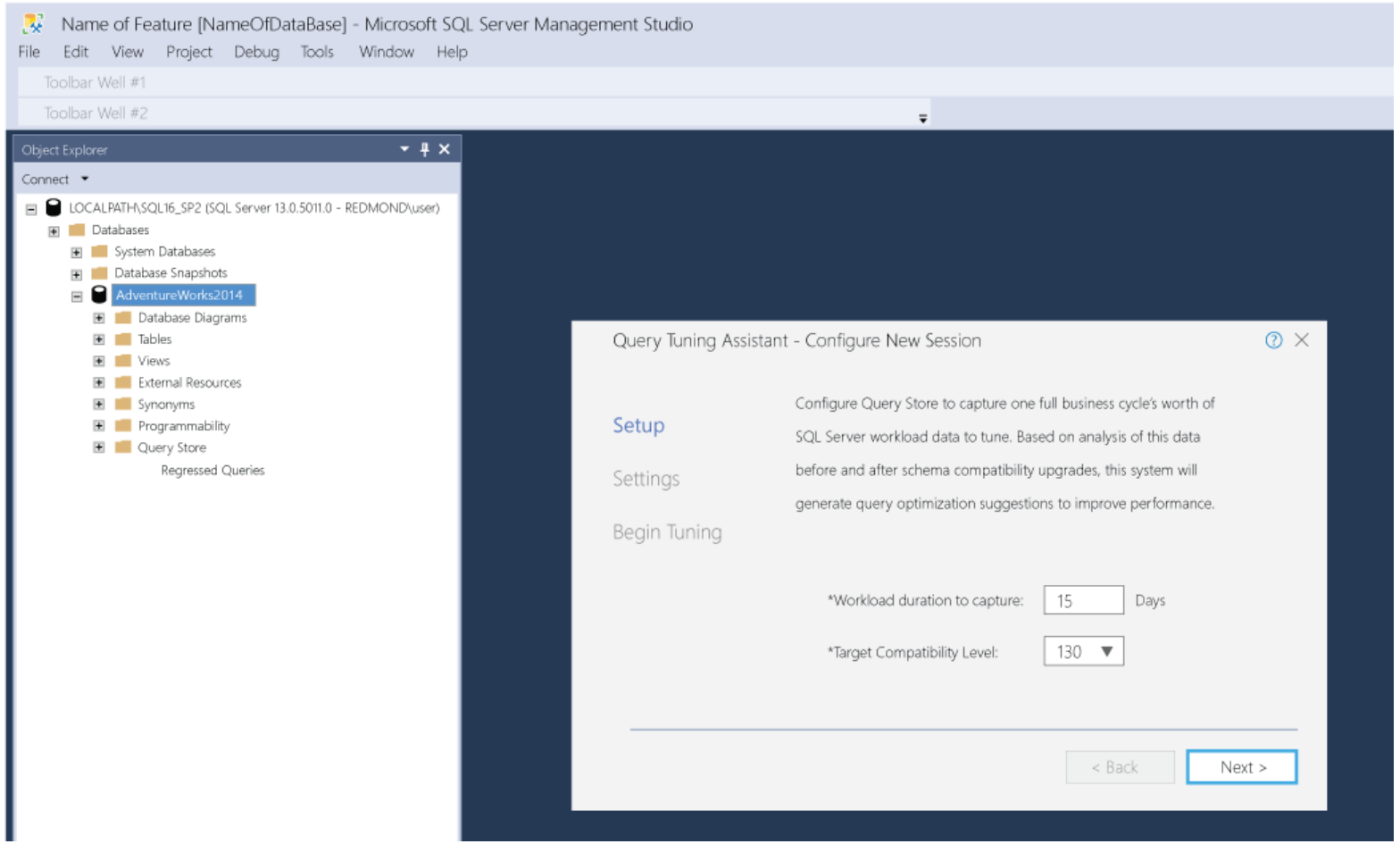
- SSMS-based wizard-like experience
- Powershell for use at scale

Powershell only private preview ongoing now. Target customers that are undergoing upgrades from older versions of SQL Server.
Sign-up now: pedro.lopes@microsoft.com

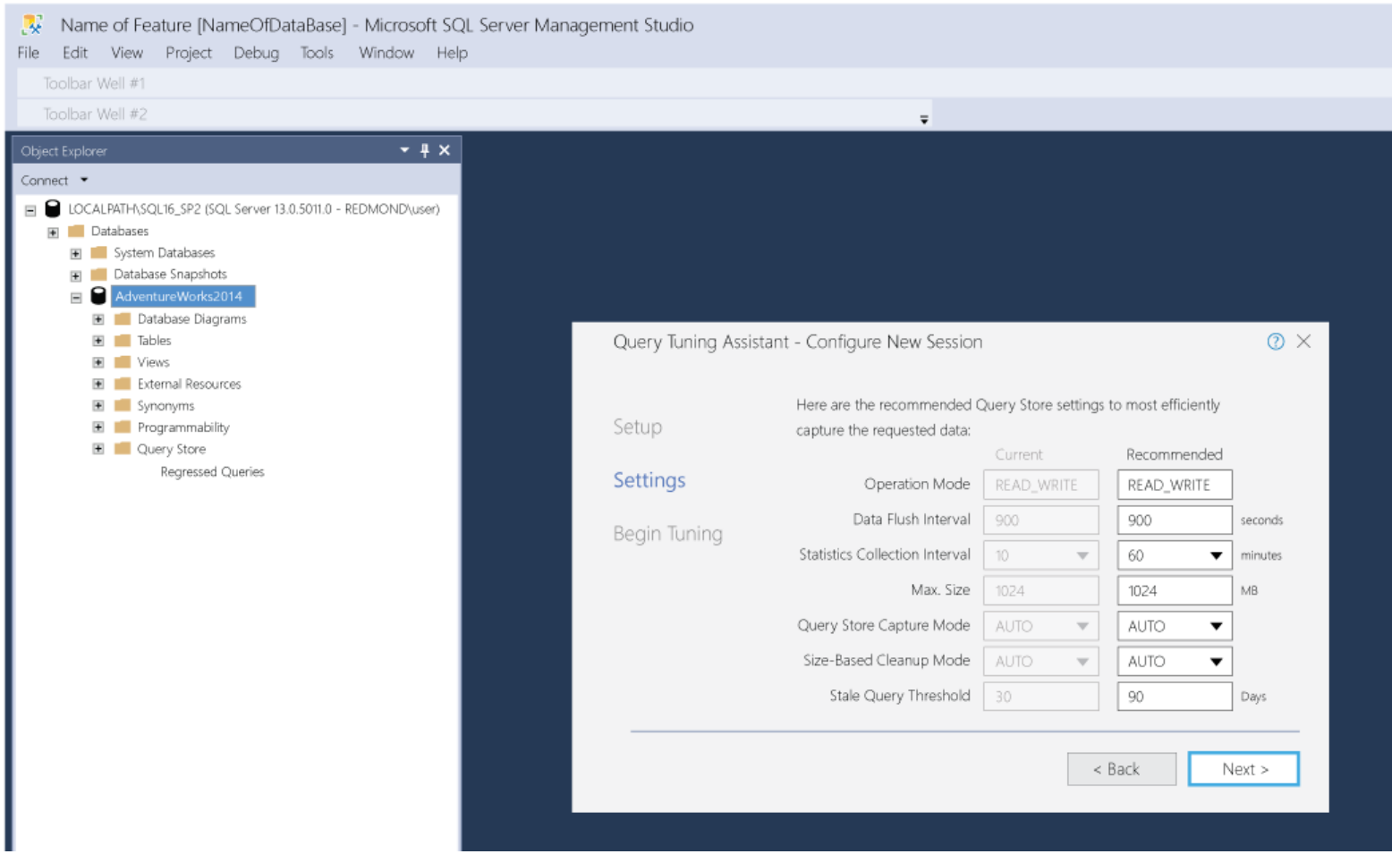
Query Tuning Assistant (QTA) - UI



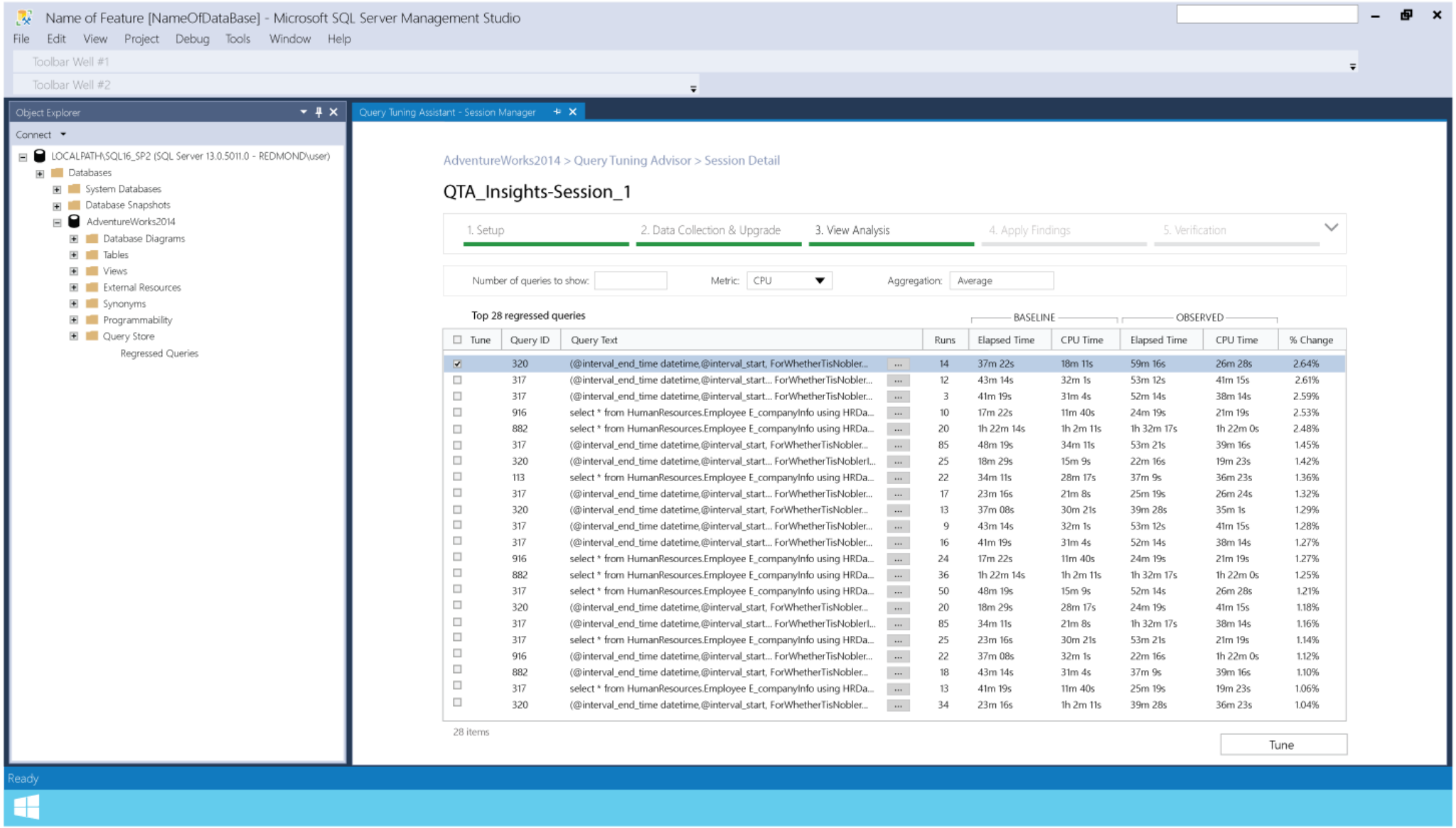
Query Tuning Assistant (QTA) - UI



Query Tuning Assistant (QTA) - UI



Query Tuning Assistant (QTA) - UI



Resources

- Upgrade SQL Server
- Database Migration Guide
- Microsoft Assessment and Planning Toolkit
- Overview of Data Migration Assistant
- DEA 2.1 General Availability: Release Overview – Database Experimentation Assistant
- Post-migration Validation and Optimization Guide
- http://aka.ms/dbcompat (DB Compatibility Level based upgrades)