SQL KONFERENZ 2025

One Bite at a time: Accelerating your migration journey to Azure SQL





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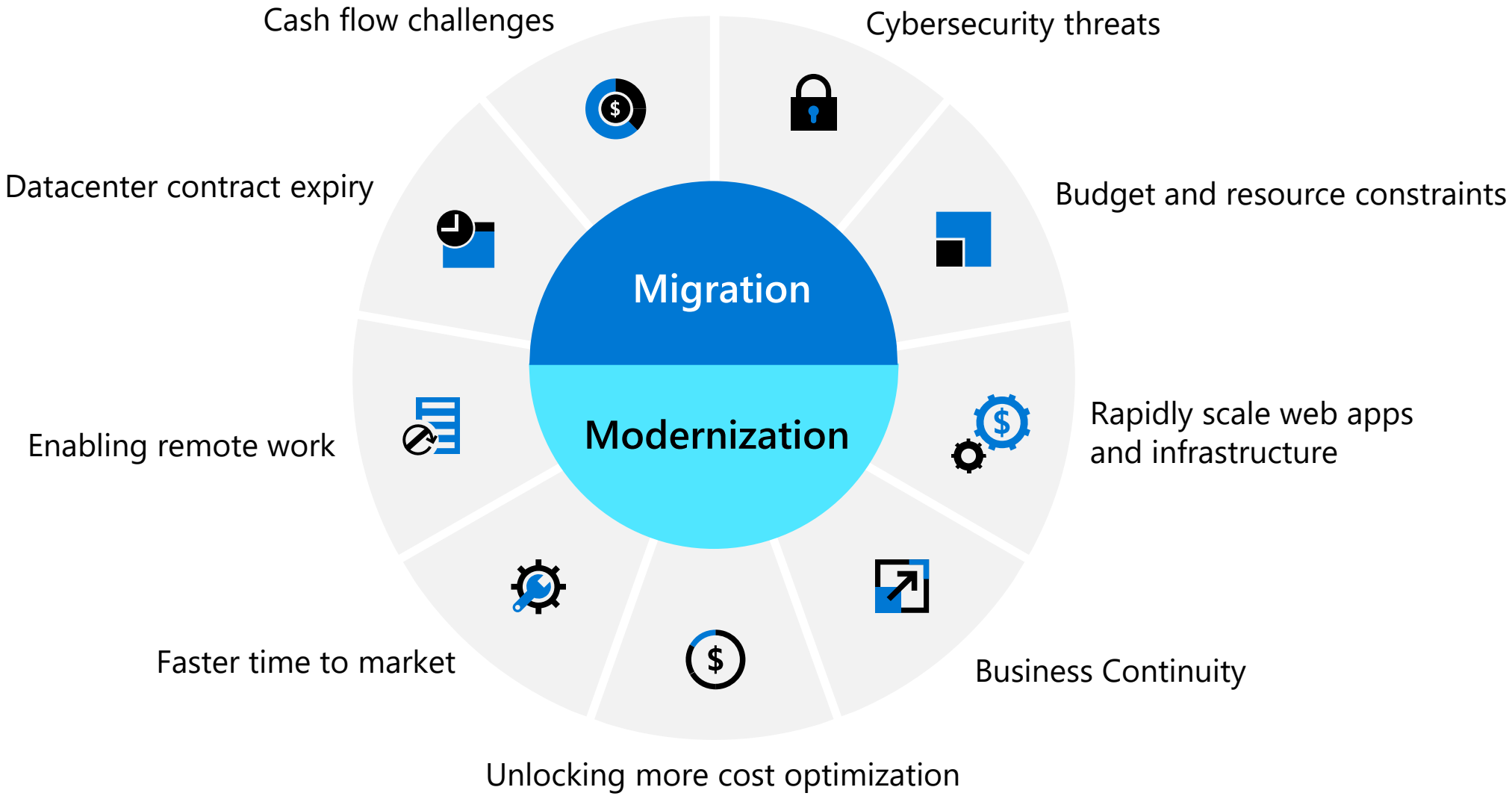
Agenda

- What’s driving migration and what is meant by Azure SQL?
- Phases of a successful migration
- Recent Customer Success Story
- Cases and Frequent Challenges
- Salient Capability in Azure Data
- Demos
- Q&A / Resources

Migration Drivers



Migration and Modernization Drivers



Understanding Migration and Modernization

Applications | Data | Infrastructure

Migration (IaaS)

Drivers: Timelines, threats & business model



Expiring contracts, security/resilience/scalability & CAPEX to OPEX

Move workloads “as-is”

Modernization (PaaS/SaaS)

Drivers: Productivity, cost optimization & business insights



Application Innovations (TTM), reduced resources and lock-in, data analytics (AI)

Update the application stack

Azure on your terms

Azure SQL

The family of SQL cloud databases



SQL Server on Azure Virtual Machines



Azure SQL Managed Instance



Azure SQL Database

Migration

Innovation

Best for: *Migrating ("lift and shift") 3rd party apps* to customer-managed Azure virtual machines.

Best for: *Migrating custom apps at-scale* to a Microsoft-managed, SQL Server-compatible instance.

Best for: *Developing highly-scalable, AI-ready applications* with SQL's reliability and security at commercial open-source database costs.



Azure SQL enabled by Azure Arc

Run Azure SQL on premises and in multicloud environments

Your first step on the journey to Azure.

Azure is the cloud that knows SQL Server best

Which Azure SQL offering is right for you?

App Innovation

Microsoft managed

Do you need

- Rapid scale-up and read-scale out?
- Up to 128TB of database storage?
- Fast backups and restores?
- Horizontal scalability (read-scale)
- Serverless compute?
- Support for Azure Functions, Azure AI Search and more?
- Pricing comparable to commercial open-source options?

Yes → **Azure SQL Database**
Hyperscale
(Recommended for new cloud app development)

Do you need

- Extreme low latency?
- *High density* elastic pools
- Lower cost storage per database
- *Auto-pausing* serverless compute?
- Support for Azure Functions, Azure AI Search and more?
- To maximize licensing and Software Assurance investments?

Yes → **Azure SQL Database**
Business critical
General purpose

No ↓

App Migration

Do you need

- An instance model?
- On-premises SQL Server compatibility?
- Native vNet support?
- To maximize licensing and Software Assurance investments?

Yes → **Azure SQL Managed Instance**

Customer managed

Do you need

- Near real-time data replication between on-premises and Azure?
- OS-level access?
- Capabilities at the VM level?
- SQL Server versions 2008 - 2022?
- SSRS/SSAS?
- To maximize licensing and Software Assurance investments?

Yes → **SQL Server on Azure Virtual Machines**

Benefits of PaaS

- Lower administrative burden
- No End of Support hassles
- Fully managed and always up to date
- Dynamic resource scaling
- Built-in high availability and automatic backups
- Supports multiple data formats capabilities

Benefits of IaaS

- Maintain OS-level control
- Easy lift-and-shift eliminates app refactoring
- Faster path to the cloud

* Use Azure Arc to enable the same services in your datacenter or on the cloud of your choice, when a hybrid or multicloud approach is required

Migration phases and tooling



Phases of a successful cloud journey



Discovery

Inventory of all SQL Servers and application servers



Planning

Secure, protect, and optimize



Execute

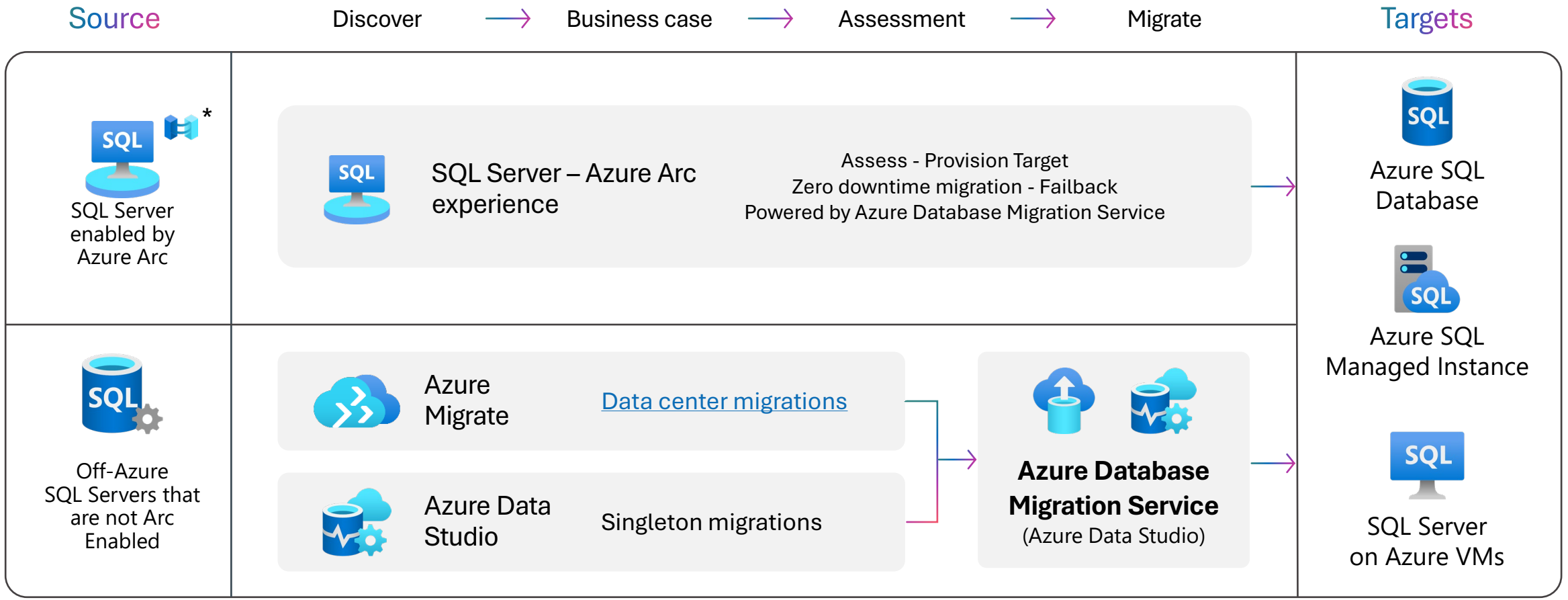
Azure SQL readiness, Azure SQL tier and size



Optimize

Replicate databases, test, and complete migration

Recommended Tools for Azure SQL Migrations



* Use Azure Arc to enable the same services in your datacenter or on the cloud of your choice, when a hybrid or multi-cloud approach is required
** Migrations are powered by Azure Database Migration Service (DMS)

Begin your journey with Azure Migrate to assess on-premises databases for migration and rehost SQL Server to Azure VMs
Database migration guide: https://aka.ms/datamigration



Homogeneous sources

Azure Database Migration Service

Supported Scenarios

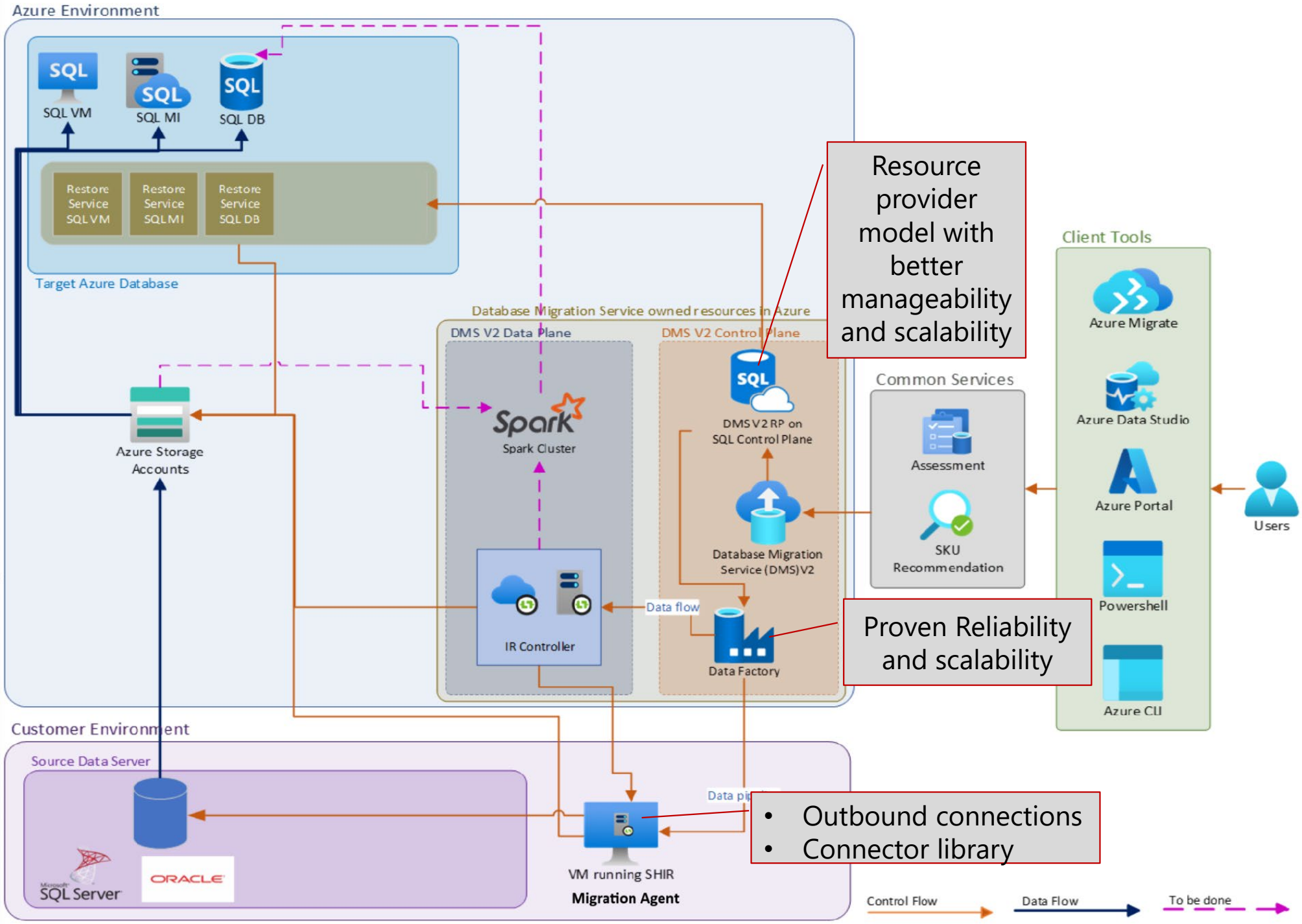
Azure SQL Targets	Offline migration	Online migration
Azure SQL Database	Yes	No
Azure SQL Managed Instance	Yes	Yes
SQL Server on Azure VM	Yes	Yes

SQL Sources	Supported
On-prem SQL Server instance	Yes
SQL Server on **Private cloud**	Yes
SQL Server on VM in **Public cloud**	Yes
AWS RDS SQL Server	Yes

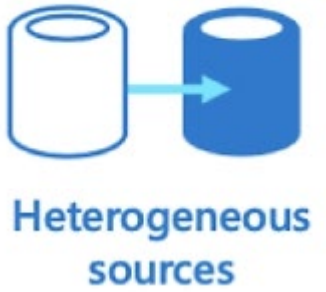
Backup Sources	Supported
Azure Blob storage	Yes
SMB Network share	Yes

Microsoft

Azure DMS
Architecture



Classified as Microsoft Confidential



SQL Server Migration Assistant

Supported Scenarios

RDBMS Sources Supported	Offline Data Migration	Data at Scale Support
Oracle	Yes	Yes
Sybase	Yes	Yes
IBM db2	Yes	No
MySQL	Yes	No
Access	Yes	No

SQL Targets	Supported
On-prem SQL Server instance (v. 2012+)	Yes
SQL Server on VM in **Public cloud** (v. 2012+)	Yes
Azure SQL DB	Yes
Azure SQL Managed Instance	Yes

Use Cases and Frequent Challenges



Migration Use Cases

Use Case	Description	Tooling	
		Homogenous	Heterogenous
One Time / Initial	• Relational and non-relational (SQL, Oracle, DB2, IMS, VSAM etc.) • Schema and object migration, scalable database migration.	• Arc Migration • DMS • ADF	• SSMA • ADF
Data Streaming	• Event-driven applications: fraud detection, IoT applications, and personalized customer experiences	• Stream Analytics • EventHub	• Stream Analytics • EventHub
Near Real Time (Sync)	• Data synchronization for Analytics and Reporting. • Co-existence scenarios for both OLTP & OLAP.	• CDC • ADF • SSIS	• ADF • SSIS
CDC: Unidirectional	• Co-existence during phased migration approach • OLTP to OLAP for reporting and analytical scenarios	• SQL Server • Striim, Qlik • Goldengate	• Qlik • IBM • Goldengate
CDC: Bi-Directional	• Co-exist / Hybrid scenarios • Active - Active replication	• SQL Server • Striim, Qlik • Goldengate	• Qlik • Goldengate

Frequent Challenges

Common Challenges

- Discovery and Assessment
- Target State Architecture on Azure.
- Online Data Migration with minimal downtime
- Complex datatype and schema migrations
- HA and DR requirements involving aggressive RTO & RPO
- Optimizing performance of workloads on SQL /Azure SQL post migration

Oracle Specific

- Complex PL/SQL constructs
- Golden gate active/active replication
- Pro*C application precompiled code
- Oracle Zero Data Loss Recovery Appliance (ZDLRA)

Mainframe Specific

- Data compatibility for difference character set (EBCDIC, ASCII) and code pages
- Integration with current security system in place. (e.g. RACF, ACF2)
- Re-engineering Mainframe data tier to Azure Data Platform (relational / non-relational)
- Schedular Integration across platforms

Customer Stories

























Deutsche Post engineers flexibility and scalability with Azure SQL Database Hyperscale

Print

Deutsche Post DHL Group

Deutsche Post DHL Group is one of the world's largest logistics companies managing national and international deliveries, warehouses and more. Its Track and Trace Parcel System allows internal services to track parcel deliveries and provides information to customers on the front end. Originally using a costly on-premises solution, the company needed a more scalable database to meet increased traffic and prepare for the future. With Azure SQL Database Hyperscale, Deutsche Post has achieved scalability and flexibility, reduced downtime and response time for requests, and greatly increased their number of service updates per year.

Learn More

- Azure SQL Database
- What is the Hyperscale service tier?
- Get updates on Azure Data and AI Services

Legal & General

Customer:
Legal & General

Industry:
Financial Services

Size:
110,000+ employees

Country:
UK

Products and services:
Azure SQL
Azure Data Factory
Azure Dev Ops

Read full story here



Safeguarding customer systems with a firm & modern technical foundation, addressing current software limitations that risk destabilizing or increasing risk was our primary objective.

—Alex McArthur, L&G's Senior Programe Manager

Situation:

L&G core workload Asset & Liability Payment Service (ALPS) on Mainframes z/OS is a highly transactional system supporting 1.7 million customers and having challenges in scalability and difficulties in managing the monolithic architecture. Late to Market due to slower development cycle and couldn't focus on innovation.

Solution:

Modernizing monolithic applications to microservices based architecture deployed on AKS and migrating the Db2 database to Azure SQL PaaS to overcome the issues of scalability, availability and maintenance.

Impact:

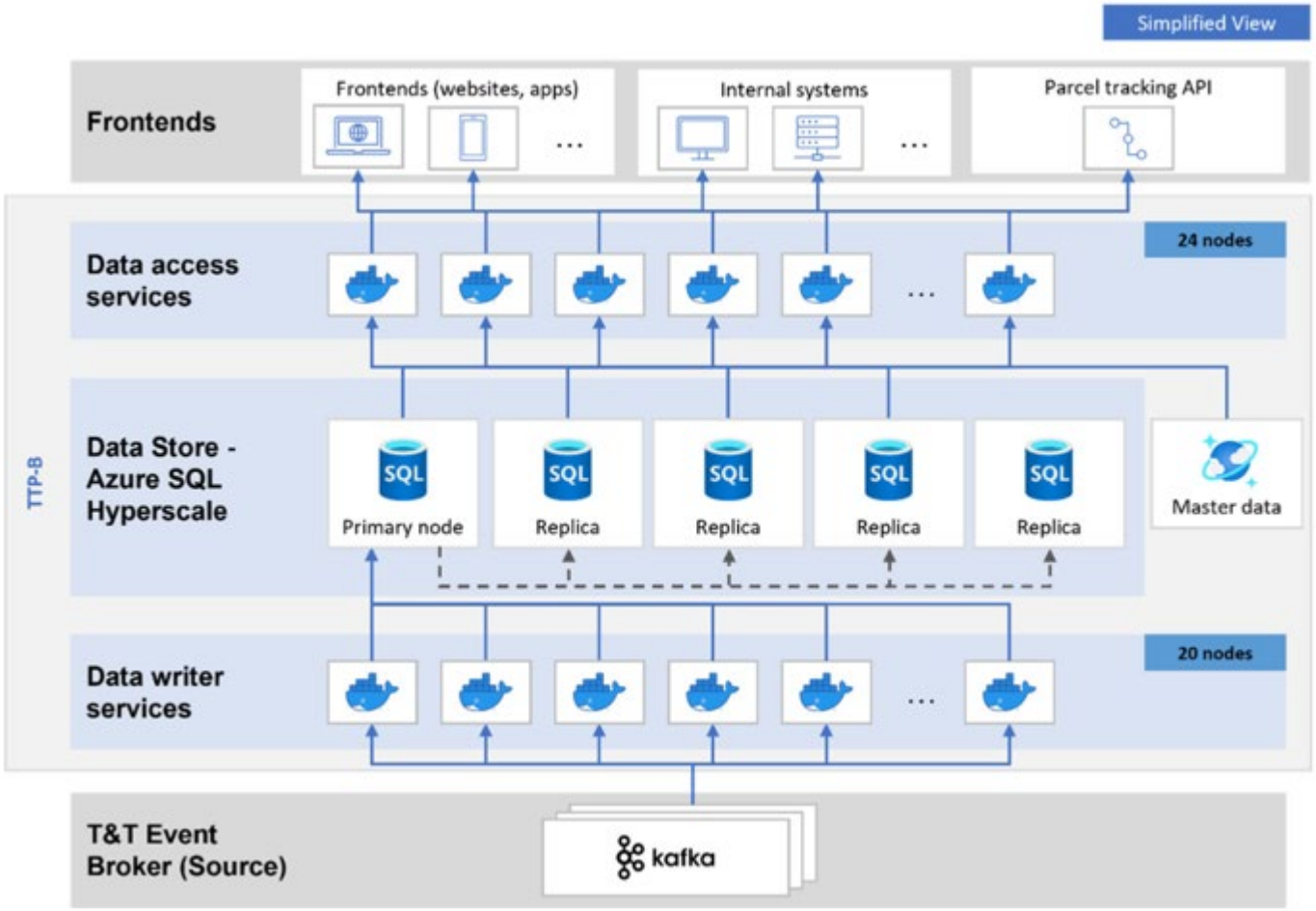
Easy to manage microservice architecture which is able to meet the growing customer demands. Total 50% reduction in TCO. Easier integration with other Azure services and expanding onto Power Platform and Open AI.

Faster deployment with DevOps CI/CD pipelines.

Microsoft

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SQL Migration Challenges – Real World Example



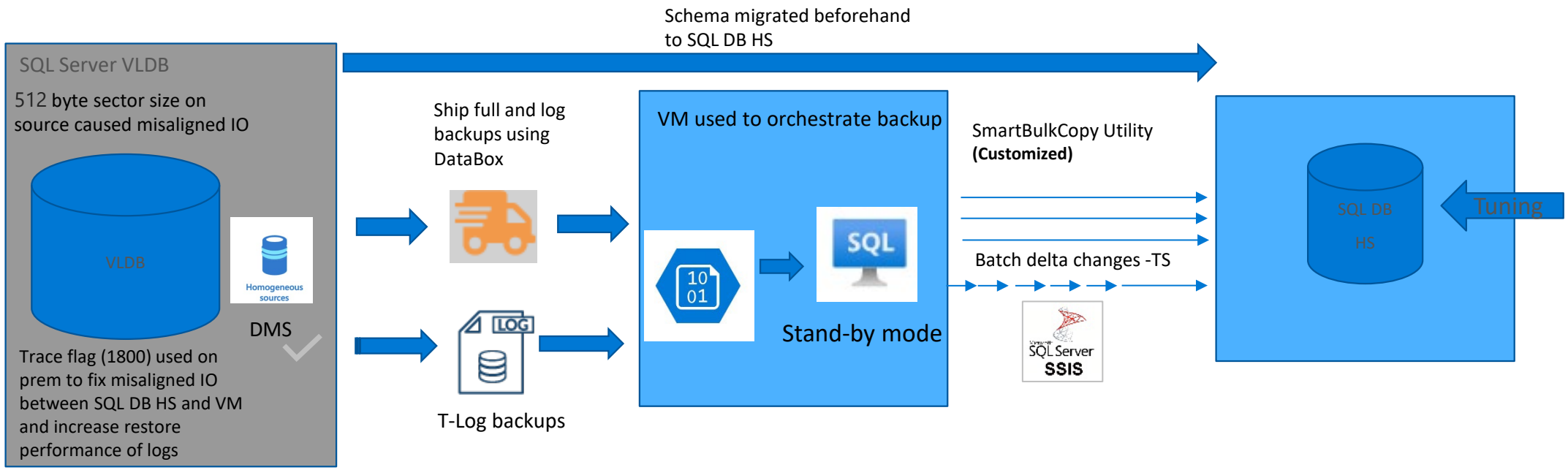
Business Situation

- On premise solution was aging and high costs.
- Seasonality of workload meant over provisioning.
- Multiple concerns on ability to open new business opportunities with data.
- Increase release frequency.
- VLDB with critical access and highly transactional.

Solution

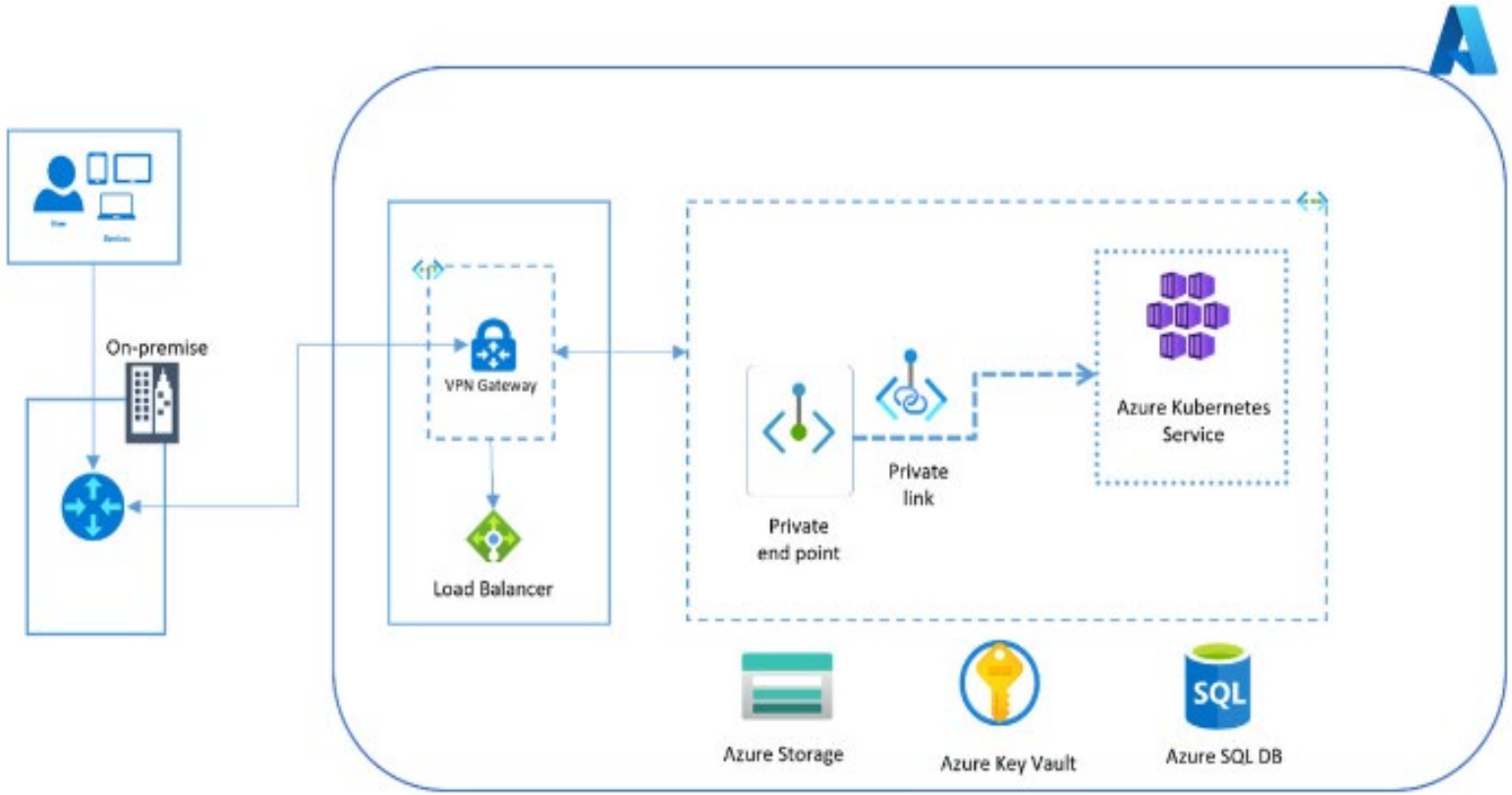
- Hyperscale offered the optimal performance and scalability.
- Near constant time scalability for seasonal workload.
- Leveraged Azure and SQL cloud native capabilities to enable new business models for the data.
- Very low downtime migration solution developed.

SQL Migration Solution



Optimized backup/ restore process, customized SmartBulkCopy and fine-tuned post migration

Db2 Modernization Challenges – Real World Example



Business Situation

- Upgrade Mainframe App to microservices.
- Address scalability issues due to variable workload.
- Mitigate legacy tech debt and cyber risks.
- Increase release frequency.
- Manage large codebase and customer base.
- Handle high transaction volume

Solution

- Rightsized the environment using Azure SQL DB. Azure SQL offers multiple service choices to choose from
- Azure provides industry leading 1st party services and tooling i.e. Custom Discovery and Assessment scripts, ADF, SSMA
- Leveraged Azure and SQL cloud native capabilities to achieve mainframe like HADR and Performance Efficiency.
- Azure also offers a rich ISV ecosystem to achieve CDC use cases i.e. Striim, Qlik, Goldengate etc.

Salient Capabilities in Azure Data Services



How to Achieve Salient Capabilities in Azure Data

Salient Capabilities	Oracle	Db2	SQL DB	SQL DB HyperScale	SQL MI	SQL Server	PostgreSQL Flex
							
High Availability	RAC, Oracle High Availability Service Daemon (OHAS)	IBM Tivoli SAMP, IBM Db2 Pacemaker	In-Built 99.995%	In-Built 99.95%	In-Built 99.99%	In-Built 99.99%	In-Built 99.99%
Disaster Recovery	Active Data Guard	IBM Tivoli SAMP, IBM Db2 Pacemaker	In-Built (including Read Replica, & Geo-Extendable)	In-Built (including Read Replica, & Geo-Extendable)	In-Built (including Read Replica, & Geo-Extendable)	Always On Availability Groups (AOAG), FCI	In-Built (including Read Replica)
Multi-region Write	Golden Gate	IBM Tivoli System Automation for Multiplatform (SAMP), IBM Db2 Pacemaker	Refactoring Needed.	Refactoring Needed.	Bi-Directional Transactional Replication	Merge Replication and Peer to Peer Replication	Refactoring Needed.
Scale-out Read	RAC, Active Data Guard	Db2 pureScale Db2 Data Sharing Groups	Read Replica	Read Replica	Read Replica	Always On Availability Groups (AOAG)	Read Replica
CDC/Replication	Golden Gate, Active Data Guard	IBM Infosphere Data Replication, Golden Gate	Supported	Partial Support (Replication subscriber)	Supported	Supported	Supported (PG_Logical Extension)
Performance – Multi-Level Partitioning	In-Built	In-Built	Refactoring Needed. (Range Partitioning)	Refactoring Needed. (Range Partitioning)	Refactoring Needed. (Range Partitioning)	Refactoring Needed. (Range Partitioning)	Supported
Performance – Fast refresh Materialized View	In-Built	In-Built	Refactoring Needed. (Indexed Views)	Refactoring Needed. (Indexed Views)	Refactoring Needed. (Indexed Views)	Refactoring Needed. (Indexed views)	Supported

Demo Time



MDCSSQL-EVGUTK1

SQL Server - Azure Arc

Search

Overview
Activity log
Access control (IAM)
Diagnose and solve problems
Resource visualizer
Settings
Security
Data management
Monitoring
Migration
Migration Journey (preview)
Automation
Help

Refresh | Delete | Feedback

Check to see if your SQL Server instance is ready to migrate to Azure SQL in the migration assessment.

Essentials

View Cost | JSON View

Resource group
ivankostic-rg

Mode
Connected

Location
centraluseuap

Subscription
ADS TINA Engineering

Subscription ID
[redacted]

SQL Server instance type
Stand-alone instance

Service Type
SQL Server Database Engine

Version
SQL Server 2022

Edition
Developer

Computer name
MDCSSQL-EVGUTK1

Operating system
Windows

Inventory upload
11/4/2024, 13:57:09 UTC

Usage upload
N/A

Tags (edit)
Add tags

Custom IP and References



Top Trending Custom IPs

Sr. #	IP Name	Problem Statement	Description	IP Link
1	**Database Compare Utility**	Customers wanted reliable mechanism to verify the integrity and accuracy of their Db2 data after migrating it to Azure SQL Data?	This utility helps customer to perform data comparison between source Db2 and target Azure SQL.	Database Compare Utility
2	**Best practices for utilizing Azure SQL to host Mainframe Data Tier & Workloads**	Customers experience initial performance issues as Migrating from Mainframe to Cloud needs different thinking.	This blog talks about best practices to be followed for Mainframe migration to Azure to get best performance.	Mainframe modernization to Azure best practices
3	**Heterogenous linked servers from Azure SQL MI**	A workaround to connect to heterogenous sources from Azure SQL MI.	This blog provides step by step instructions to a workaround to connect to heterogenous data sources from Azure SQL MI.	Heterogenous Linked Servers from Azure SQL Managed Instance
4	**Copy files from Mainframe to Azure Data Platform using ADF FTP Connector**	Customers need managed file transfer option from Mainframe to Azure Storage.	This blog provides detail steps to setup file transfer from Mainframe to Azure storage using ADF FTP.	Mainframe to Azure Storage file transfer
5	**Mainframe EBCDIC Data File to ASCII conversion using Azure Logic App**	Customer requirement to have Azure cloud-based solution to perform Mainframe files conversion to ASCII	This blog provides potential option for converting Mainframe EBCDIC files to ASCII.	EBCDIC to ASCII conversion using Azure Logic App
6	**Db2 to Azure SQL Schema conversion guide**	Customers want to modernize Db2 data tier to Azure SQL	This guide provides information on how to use SSMA to perform Db2 schema conversion to Azure SQL	Db2 Schema conversion to Azure SQL using SSMA
7	**Mainframe RACF Id Migration to Azure**	Customers want option to perform Mainframe login mainframe to Azure.	This technical provides potential solution to perform Mainframe RACF Id migration to Azure Active Directory (Microsoft Entra ID).	RACF Migration to Azure Active Directory
8	**Data Workload Assessment Model and Tool**	An excel based tool provides a one click calculation to asses large data estate migrations.	This tool has a set of 41 questions across 12 categories to make the target decision process faster.	Data Workload Assessment Model and Tool

Learn more about the Arc enabled Migration options and request access to preview

- When will it be available?
  - Currently in Private Preview.

- How to sign up?
  - Fill out the request form at https://aka.ms/arc-migrations-preview



- Need more information?
  - Reach out to me – des.fitzgerald@microsoft.com or talk to me here at the conference.

Thank You

Please give feedback

