Migrating SQL Server Databases to Azure

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Azure Database Migration Guides

Step-by-step guidance for modernizing your data assets.
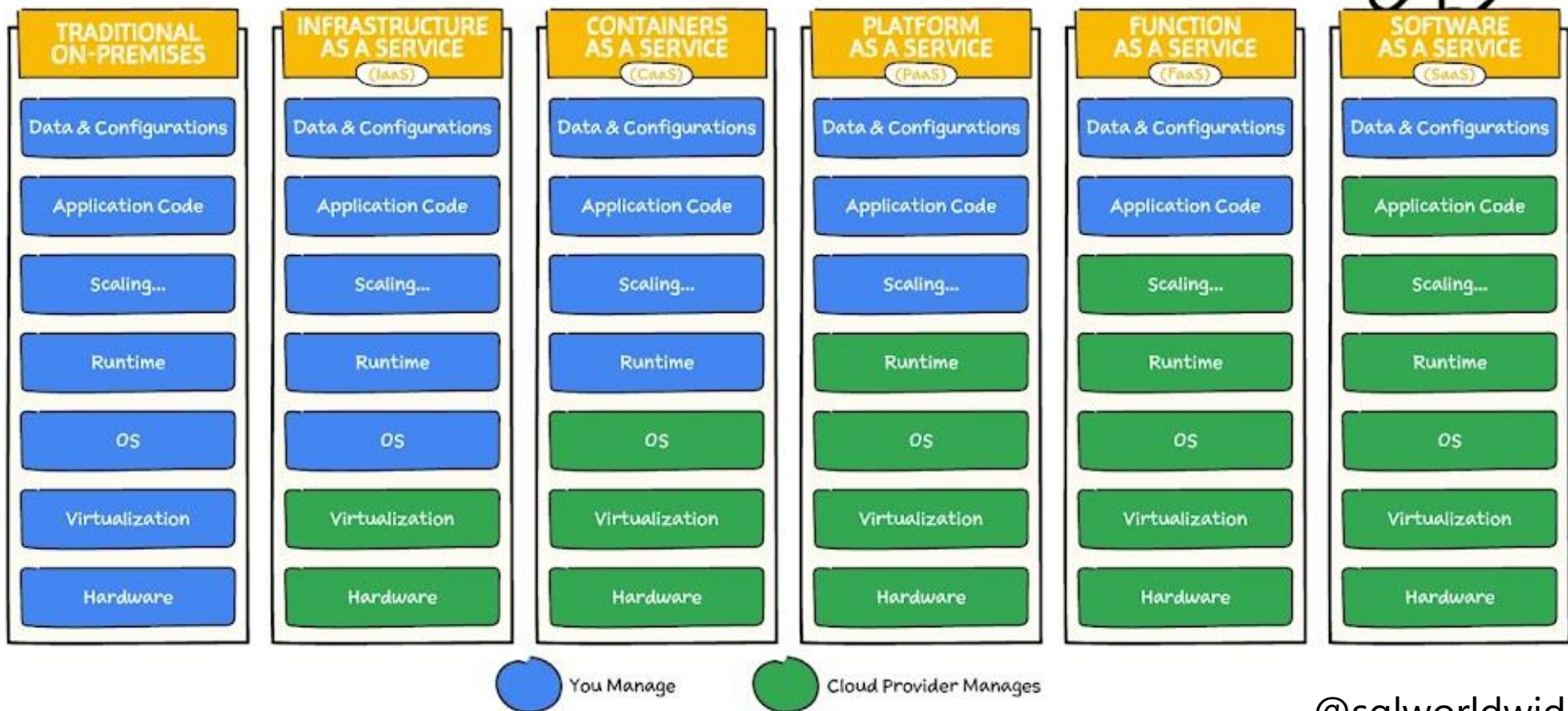
Log generation rate maximum

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Options

Azure SQL Database

Azure SQL Managed Instance

SQL Server on Azure VMs

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Wait... what is Cloud again?

TRADITIONAL ON-PREMISES	INFRASTRUCTURE AS A SERVICE (IaaS)	CONTAINERS AS A SERVICE (CaaS)	PLATFORM AS A SERVICE (PaaS)	FUNCTION AS A SERVICE (FaaS)	SOFTWARE AS A SERVICE (SaaS)
Data & Configurations	Data & Configurations	Data & Configurations	Data & Configurations	Data & Configurations	Data & Configurations
Application Code	Application Code	Application Code	Application Code	Application Code	Application Code
Scaling...	Scaling...	Scaling...	Scaling...	Scaling...	Scaling...
Runtime	Runtime	Runtime	Runtime	Runtime	Runtime
OS	OS	OS	OS	OS	OS
Virtualization	Virtualization	Virtualization	Virtualization	Virtualization	Virtualization
Hardware	Hardware	Hardware	Hardware	Hardware	Hardware

You Manage   Cloud Provider Manages

	Azure SQL Database	Azure SQL Managed Instance	SQL Server on Azure VM
Size	4 TB/100 TB	16 TB[1]	2 PB
SLA	99.995%	99.99%	99.99%
Backups	✓	✓	[2] ✗
Patching	✓	✓	[2] ✗
Version	Compatibility Level	Compatibility Level	Both
Scaling	Online	Online	Offline
HA/DR	✓	✓	✗

1 = Datafile is limited to 8TB
2 = SQL Server IaaS Agent extension

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Key Factors

- Number of servers and databases
- Size of databases
- Downtime available
  - Offline
  - Online

Deployment Models (PaaS)

- Single database
- Elastic pool

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Purchasing Models (PaaS)

- Virtual core (vCore) model

- Database Transaction Unit (DTU) model

- Serverless model[1]

1=SQL Database serverless is currently only supported in the General-Purpose tier on Generation 5 hardware in the vCore purchasing model. The serverless compute tier is available in the General Purpose service tier and currently in preview in the Hyperscale service tier.

CPU usage
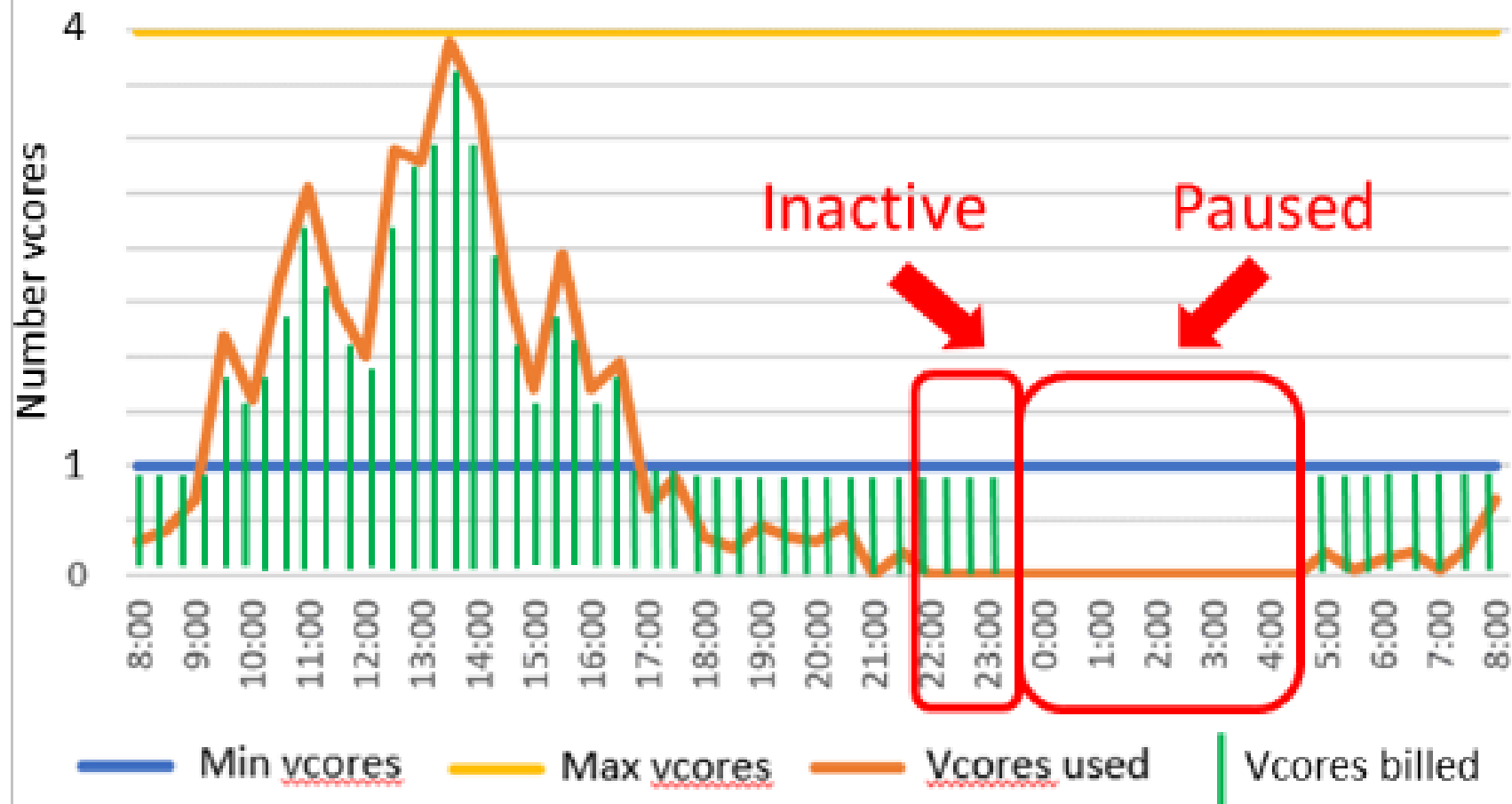
Service Tiers (PaaS)

- General purpose/Standard service
- Business critical/Premium service
- Hyperscale service tier

.DACPAC

.BACPAC

Can be interacted using SSMS, PowerShell and .NET

Can see XML content by renaming to .zip

Schema

Schema + Data

⚠️

Transaction log rate governance

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Features

Feature Considerations

- SQL Server Integration Services
- SQL Server Reporting Services
- High availability
- Logins and Groups
- SQL Agent jobs
- System Databases

Features in Azure

- Automated backups
- Microsoft Entra authentication
- Auditing
- Ledger
- Defender for Azure SQL
  - Vulnerability assessment
  - Threat protection

- SQL insights (Preview) in Azure Monitor
- Intelligent Performance
- Query Performance Insight
- Monitoring with Metrics and Diagnostic
- Scale up and down

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Migration Tools

Discover/Assess

- Azure Migrate
- Data Migration Assistant
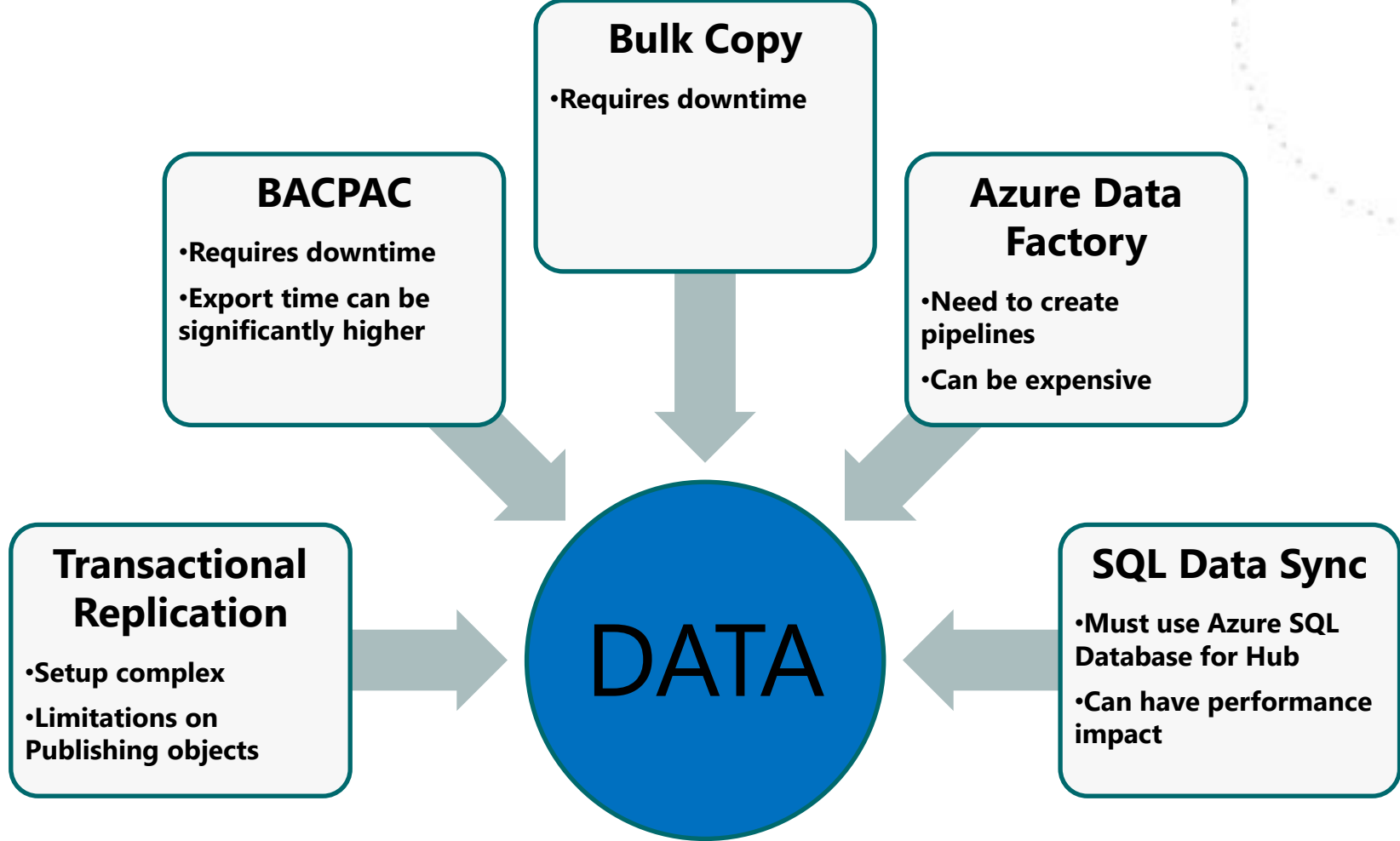- Database Experimentation Assistant

Migrate

- DACPAC/BACPAC
- Azure Migrate
- Database Migration Assistant
- Azure Database Migration Services
- Azure Data Box

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Capability	Azure Migrate	Data Migration Assistant (DMA)	SQL Server Migration Assistant (SSMA)	Azure Database Migration Service (DMS)	Database Experimentation Assistant (DEA)	ADS Extension
Discover and assess SQL data estate	Y	Y	N	N	N	Y
Migrate SQL Server objects to SQL Database or SQL Managed Instance	N	Y	N	Y	N	Y
Lift and shift SQL Server to SQL Server on Azure VM	Y	N	N	N	N	N
Migrate (and/or upgrade) SQL Server to SQL Server on Azure VM	N	Y	N	N	N	N
Migrate non-SQL objects (Oracle, Access, DB2, and so on)	N	N	Y	N	N	N
Migrate open-source databases (MySQL, PostgreSQL, MariaDB, and so on)	N	N	N	Y	N	N
Compare workloads between	N	N	N	N	Y	Y

Compare SQL data migration tools

Bulk Copy
- Requires downtime

BACPAC
- Requires downtime
- Export time can be significantly higher

Azure Data Factory
- Need to create pipelines
- Can be expensive

Transactional Replication
- Setup complex
- Limitations on Publishing objects

DATA

SQL Data Sync
- Must use Azure SQL Database for Hub
- Can have performance impact
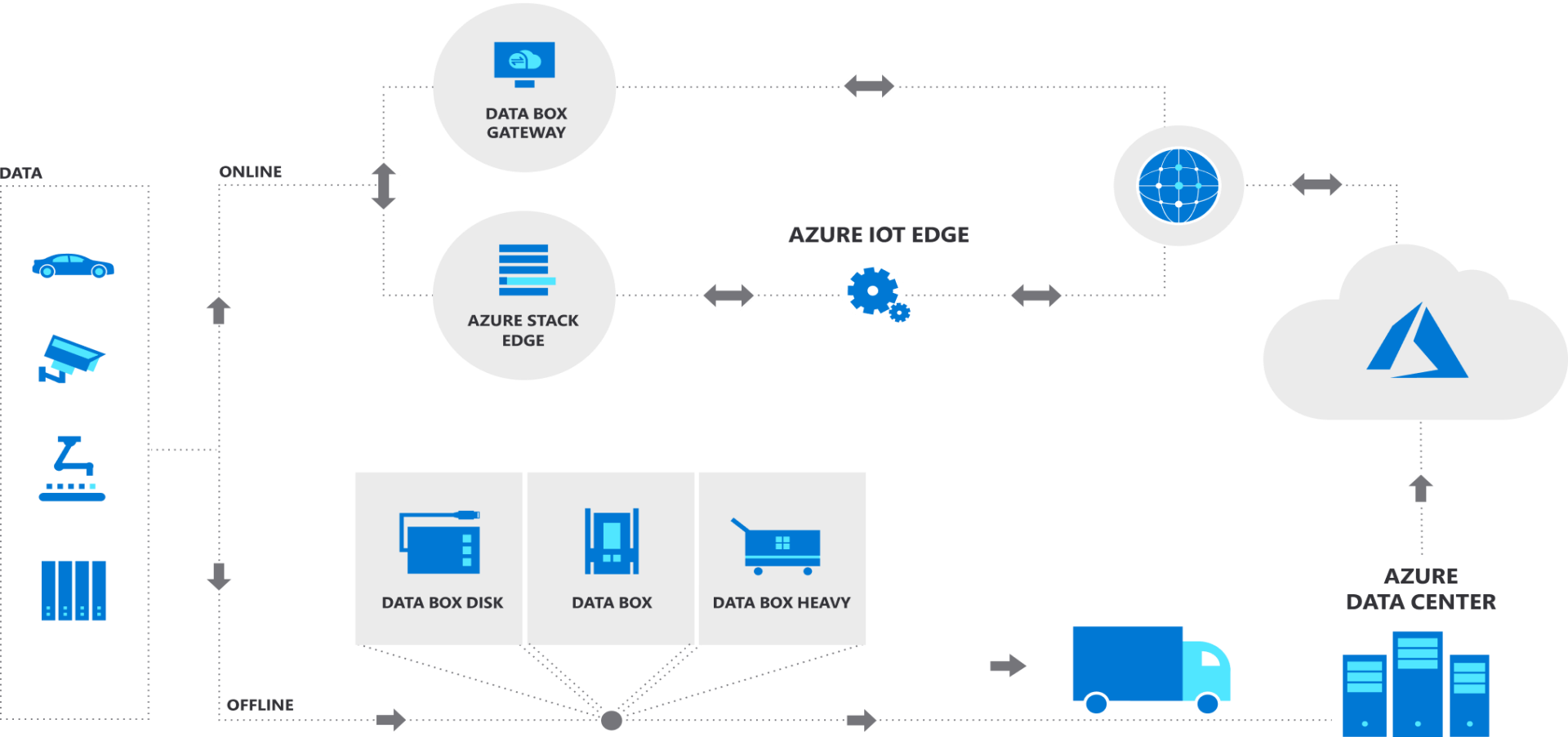
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Azure Data Box

Data Box

Get your data to the cloud

DEMO

SQL 2022 CU9

Azure Portal

Azure Data Studio

Visual Studio

PowerShell

PowerShell Notebook

SQL Server Management Studio

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Reference

- **Azure Database Migration Guides**

- **Azure Database Migration Service**

- **Migration guide: SQL Server to Azure SQL Database**

- **Perform a SQL Server migration assessment with Data Migration Assistant**

- **Configure public endpoint in Azure SQL Managed Instance**

- **Migrate a SQL Server database to Azure SQL Database using Azure PowerShell**

- **Assess the readiness of a SQL Server data estate migrating to Azure SQL Database using the Data Migration Assistant**

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