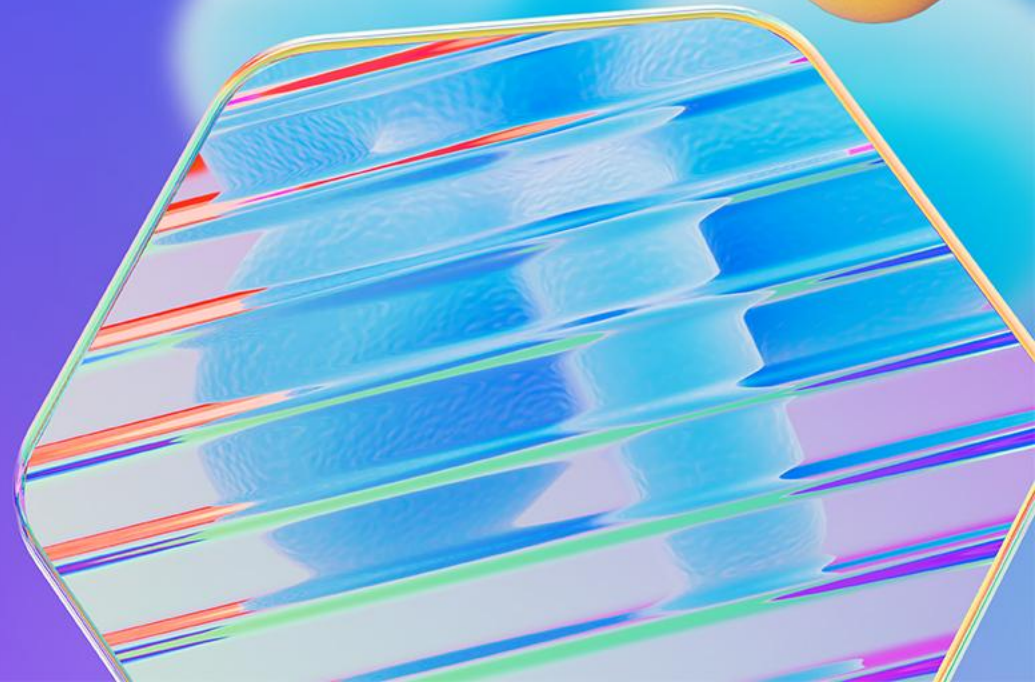




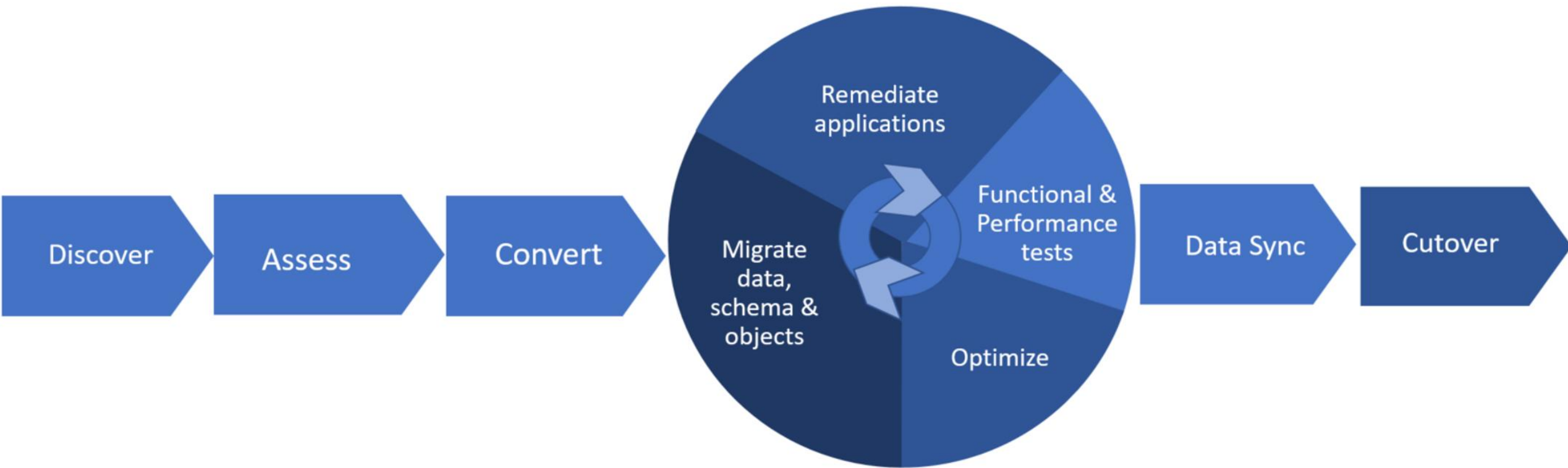
Migration Tools and Techniques

Speaker Name

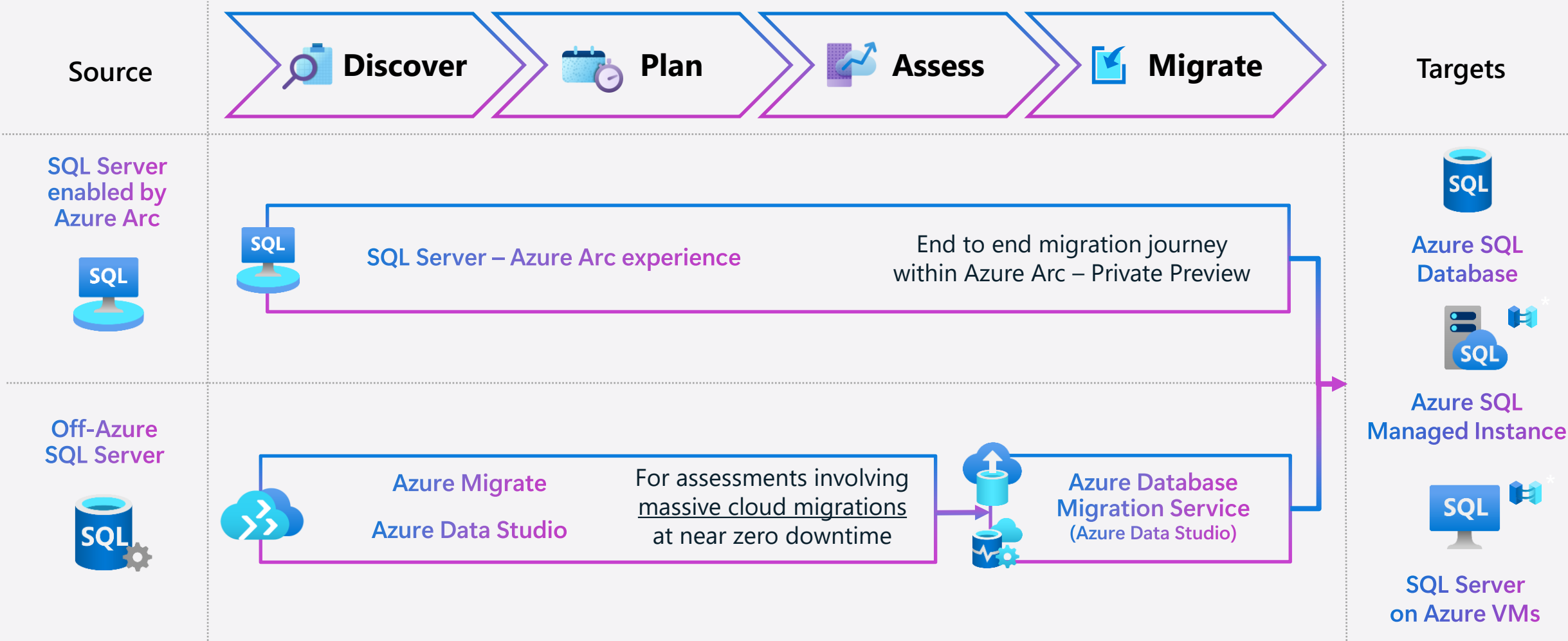
Today's digital transformation landscape



Database Migration Lifecycle



Migration scenarios to Azure SQL



* 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

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>

Data Migration Toolset & Options

Azure Migrate

Discover, assess, plan, migrate and modernize with an integrated tool.

Azure Data Studio SQL Migration Extension



Analyze Database and Instance level compatibility.

Perform Online/Offline Migration through Azure Data Migration Service

Data Migration Assistant



Tool for detecting compatibility issues that can impact database functionality in the new version of SQL Server or Azure SQL.

Data Migration Service

Streamline database migration to Azure.

Managed service platform for migrating databases.

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

Alternative Methods

Backup / Restore
Log Replay Service
Azure SQL MI Link

Transactional Replication
Bulk Copy
Import/Export (BacPac)
Azure Data Factory

Azure ARC

Single pane glass management across multiple clouds, migration assessment and live migrations*

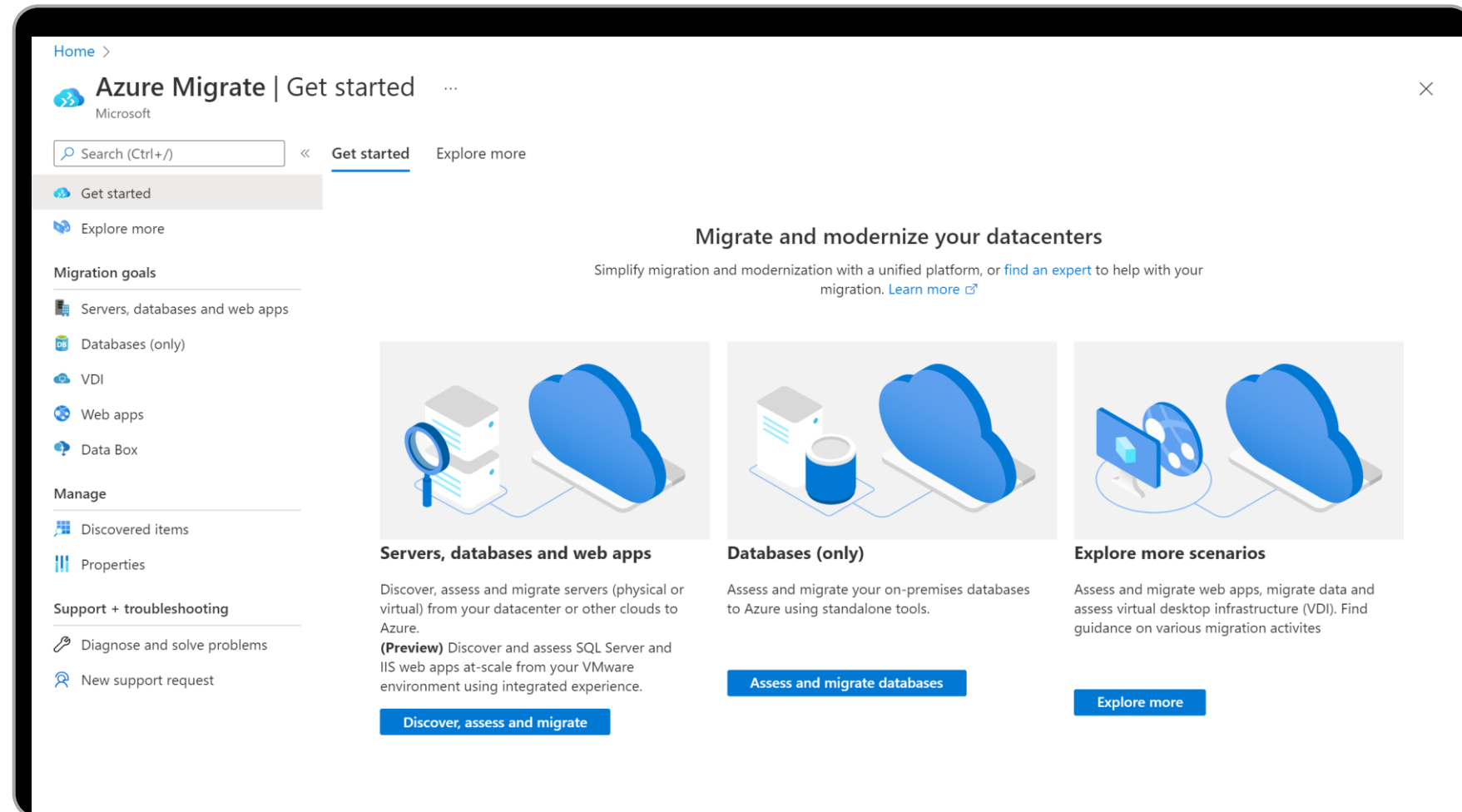
Azure Migrate (1 of 3)

Simplify your migration to and modernization in Azure with a unified platform

Comprehensive feature set

Discover, assess, plan, migrate and modernize with an integrated tool

Migrate and modernize infrastructure, VDI, data and applications on Windows and Linux in a consistent manner.



Azure Migrate (2 of 3)

Simplify your migration to and modernization in Azure with a unified platform

Unified migration and modernization

Use the guided experience and progress dashboard to walk you through all aspects of migration and modernization and manage from a single portal.

The screenshot displays the Azure Migrate dashboard for the project 'FabrikamDemo'. The interface is divided into several sections:

- Navigation:** Includes links for 'Home > Azure Migrate', 'Get started', 'Explore more', and 'Migration goals' (Servers, databases and web apps, Databases (only), VDI, Web apps, Data Box).
- Manage:** Includes links for 'Discovered items', 'Properties', and 'Support + troubleshooting' (Diagnose and solve problems, New support request).
- Assessment tools:** Titled 'Azure Migrate: Discovery and assessment', it shows a search bar, tabs for 'Discover', 'Dependency analysis', 'Assess', and 'Overview'. It displays metrics for 'Discovered servers' (21388), 'Servers running SQL Server' (64), and 'Web servers' (103). It also shows 'OS distribution' (Windows: 20875, Linux: 414, Unknown: 99) and 'Dependency analysis progress' (124 Servers, 21388 total). A 'Next step' section suggests refining application grouping or starting migration.
- Migration tools:** Titled 'Migration and modernization', it shows tabs for 'Discover', 'Replicate', 'Migrate', and 'Overview'. It displays metrics for 'Discovered servers' (672), 'Replications' (0), and 'Test Migrations' (4).

Azure Migrate (3 of 3)

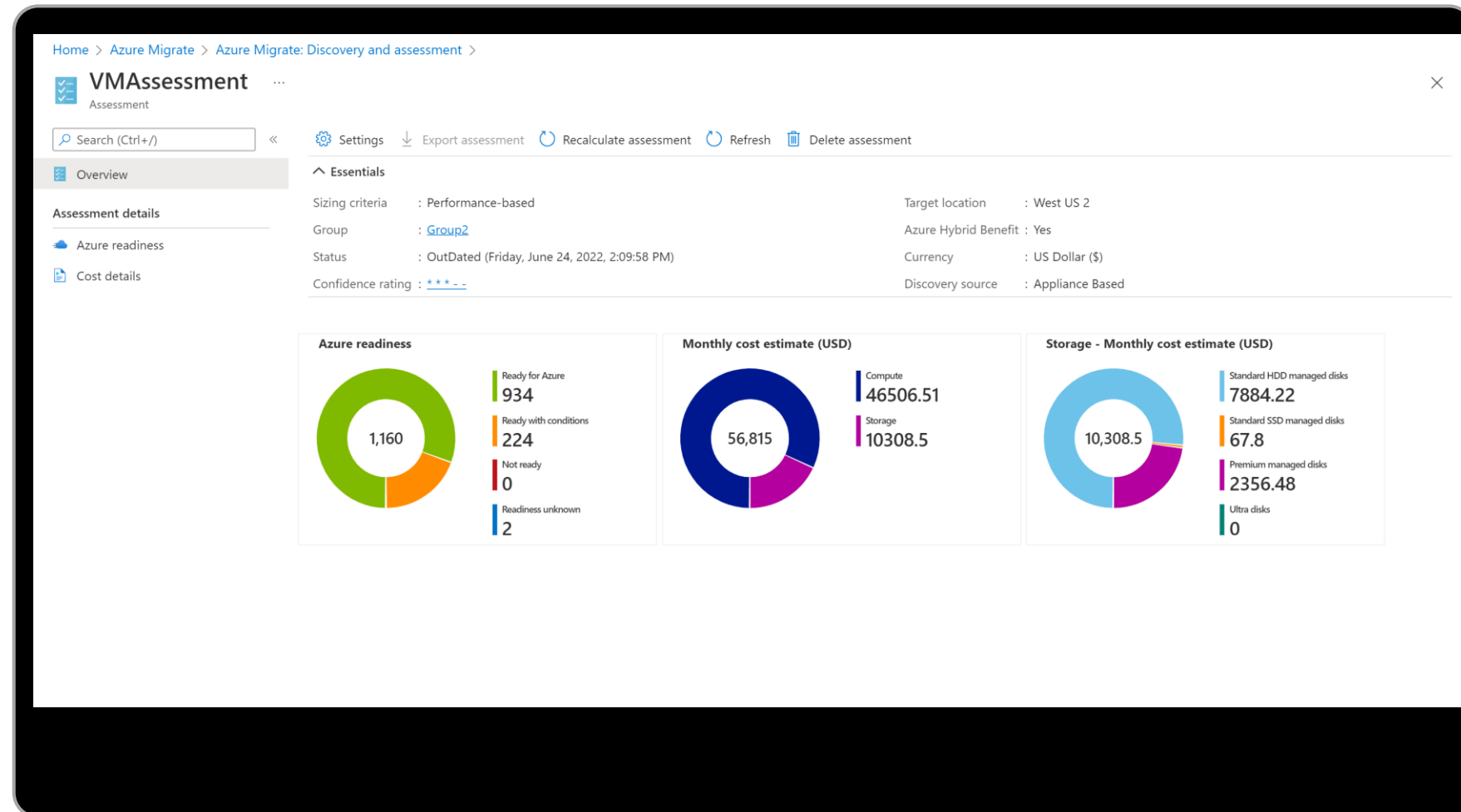
Simplify your migration to and modernization in Azure with a unified platform

Optimized management

Right-size your Azure footprint for appropriate performance and cost to meet your SLA

Manage hybrid workloads centrally

Modernize to PaaS/SaaS for highest ROI



Azure Data Studio *SQL Migration Extension*



The screenshot displays the 'Azure SQL Migration' extension interface. On the left is a sidebar with navigation options: Home, Databases, Administration (containing SQL Agent), and General (containing SQL Assessment and the selected Azure SQL Migration). The main panel has a 'Dashboard' tab and a 'Migrations' tab. Below the tabs are links for '+ New migration', 'New support request', and 'Feedback'. The main heading is 'Azure SQL Migration', followed by a descriptive paragraph. A 'Migrate to Azure SQL' button is present, with a sub-description 'Migrate a SQL Server instance to Azure SQL.'. To the right, a list of prerequisites is provided, including requirements for an Azure account, source database location, target Azure SQL instance, and backup details. Below this is a 'Database migration status' section with a 'Refresh' button. It shows a 'migrate (change)' button for the 'Azure Database Migration Service' and two summary cards: 'Database migrations in progress' with a count of 0, and 'Database migrations completed' with a count of 1. A 'Help articles and video links' section on the right contains links to migration guides and tutorials.

Home > .

Dashboard Migrations

+ New migration New support request Feedback

Azure SQL Migration

Determine the migration readiness of your SQL Server instances, identify a recommended Azure SQL target, and complete the migration of your SQL Server instance to Azure SQL Managed Instance, SQL Server on Azure Virtual Machines or Azure SQL Database.

Migrate to Azure SQL
Migrate a SQL Server instance to Azure SQL.

Things you need before starting your Azure SQL migration:

- An Azure account (not required for assessment or SKU recommendation functionality)
- A source SQL Server database(s) running on on-premises, or on SQL Server on Azure Virtual Machine or any virtual machine running in the cloud (private, public).
- An Azure SQL Managed Instance, SQL Server on Azure Virtual Machine, or Azure SQL Database to migrate your database(s) to.
- Your database backup location details, either a network file share or an Azure Blob Storage container (not required for Azure SQL Database targets).

[Learn more](#)

Database migration status Refresh

migrate (change)
Azure Database Migration Service

Database migrations in progress 0

Database migrations completed 1

Help articles and video links

[Migrate databases using Azure Data Studio](#)

The Azure SQL Migration extension for Azure Data Studio provides capabilities to assess, get right-sized Azure recommendations and migrate SQL Server databases to Azure.

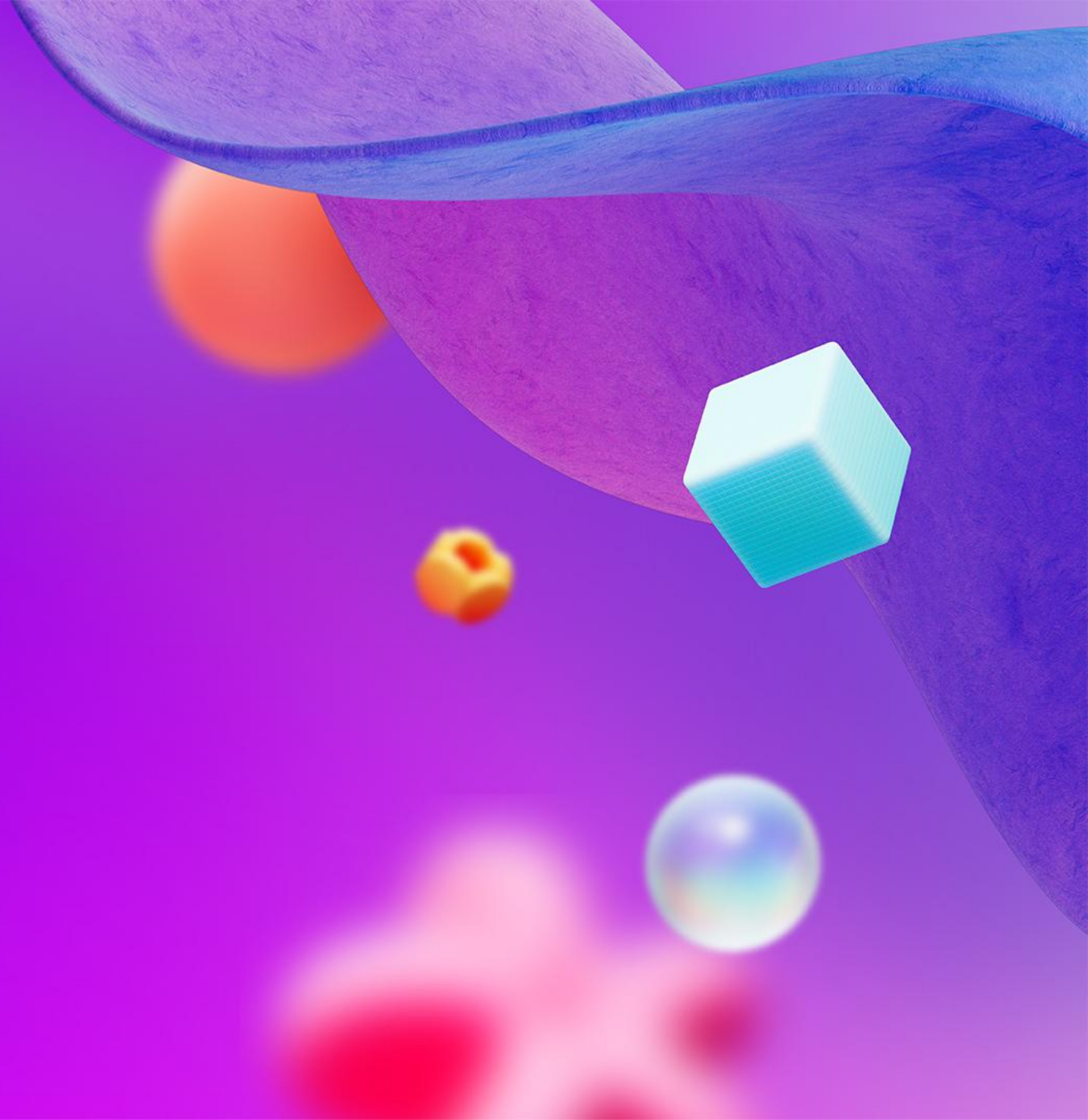
[Tutorial: Migrate to Azure SQL Managed Instance \(online\)](#)

A step-by-step tutorial to migrate databases from a SQL Server instance (on-premises or Azure Virtual Machines) to Azure SQL Managed Instance with minimal downtime.

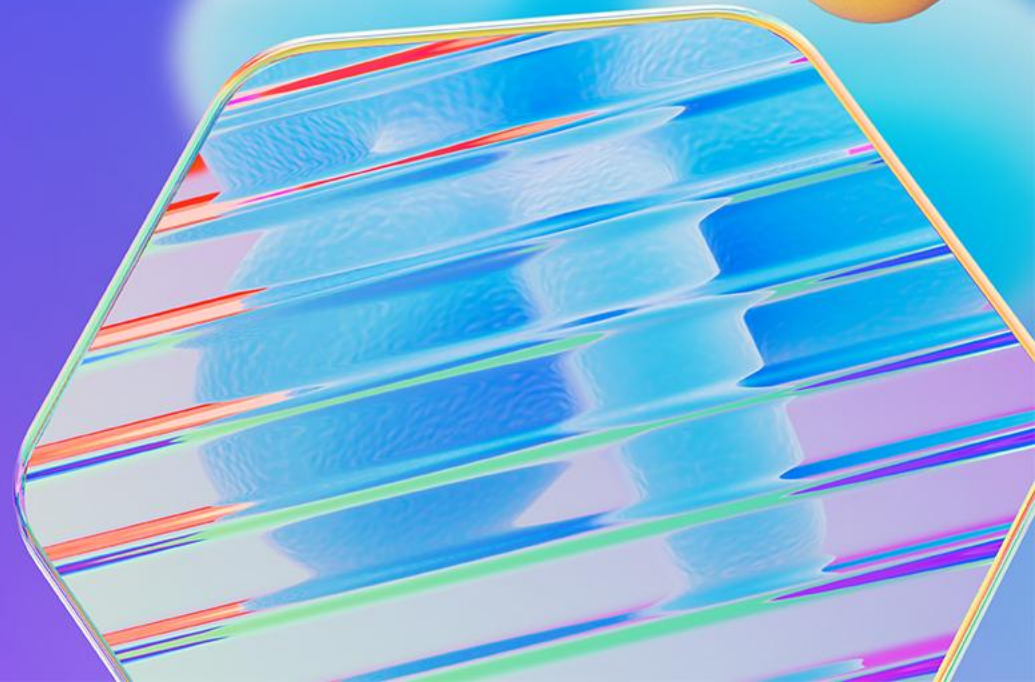
[Tutorial: Migrate to SQL Server on Azure Virtual Machines \(online\)](#)

Demo

Azure Data Studio



Migrate SQL Server using Arc

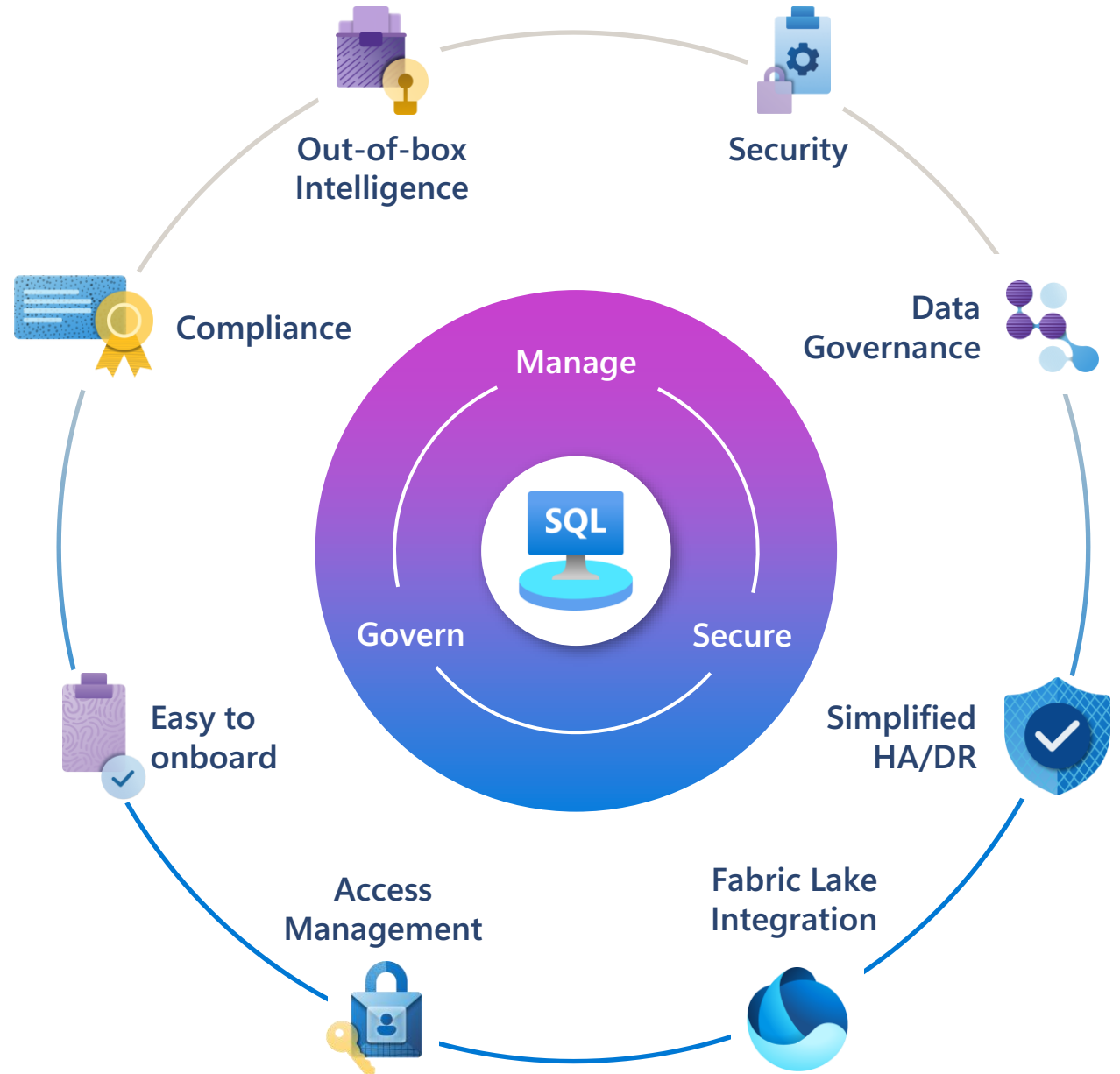




Azure Arc extends Azure services to SQL Server anywhere

Streamline migration journey to Azure, effectively manage SQL estate at scale and strengthen security and governance posture

Cloud innovation. Anywhere.



Bring cloud manageability to SQL Server anywhere

Manage, govern, and protect your SQL Server from Azure



Manage all SQL estate
with better observability

Single view of all SQL Servers deployed on-premises, in Azure and other clouds

Capture key performance metrics with out-of-box **monitoring**

Gain proactive and actionable insights with automated **best practices assessment**

Utilize **migration assessment** and best-fit recommendation on SQL IaaS/PaaS



Enhance business
continuity

Manage **Availability Groups** inventory and track real-time health status

View Always-on **Failover Cluster Instances** and protect with Defender

Enhance operational efficiency through configurable **Automated backups**

Minimize downtime and operational disruption with **Point-in-time restore**



Govern and protect all
SQL estate using Azure

Protect your on-premises and multicloud data using **Microsoft Defender** for Cloud

Enhance security using **Extended Security Updates** as a service and **auto patching**

Central insights and governance across all SQL Servers with Microsoft Purview

Unified sign-on experience with Microsoft Entra ID authentication



Azure Pay-As-You-Go enabled by Azure Arc for SQL Server anywhere, with simplified onboarding

Copilot for SQL Server

Enable self-help for day-to-day management

Gain insights on running a performant, secure and reliable SQL Server environment at scale

Simplify inventory management even further

Azure Resource Graph query to track instance and database level info

Home > SQLVM-1 SQL Server - Azure Arc

Search 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: [bwazurearcsqlg](#)
Mode: Connected
Location: [East US 2](#)
Subscription: [AzureSQL_bobward](#)
Subscription ID: 0efc44aa-c965-420f-aac4-fff305dbc...
Version: SQL Server 2022
Edition: Enterprise
Computer name: [SQLVM-1](#)
Operating system: windows
Always On role: Availability Group Replica
Inventory upload: 5/11/2024, 15:36:07 UTC
Usage upload: 5/11/2024, 14:27:08 UTC

Copilot Preview

Sure, here is the list of Availability Groups configured for your Arc SQL Server instance:

AG Name	Sync State
sqlag	NOT SYNCHRONIZING

Currently, there is only one Availability Group named 'sqlag' configured for your Arc SQL Server instance. Please note that the synchronization state of this Availability Group is 'NOT SYNCHRONIZING'. This means that the secondary databases are not currently

How can I fix the 'NOT SYNCHRONIZING' state of my Availability Group?

What are the steps to add a new Availability Group to my Arc SQL Server instance?

Can you show me the health status of my Arc SQL Server instance?

I want to ...

Home > SQLVM-1 SQL Server - Azure Arc

Search 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: [bwazurearcsqlg](#)
Mode: Connected
Location: [East US 2](#)
Subscription: [AzureSQL_bobward](#)
Subscription ID: 0efc44aa-c965-420f-aac4-fff305dbc97
Version: SQL Server 2022
Edition: Enterprise
Computer name: [SQLVM-1](#)
Operating system: windows
Always On role: Availability Group Replica
Inventory upload: 5/11/2024, 14:36:07 UTC
Usage upload: 5/11/2024, 14:27:08 UTC

Tags (edit) Add tags

Properties Capabilities

SQL Server configuration

License type: ESU subscription
License with Software Assurance: N/A

Copilot Preview

Your wait type instance, including my most type that begins with 'PREEMPTIVE_' and 'PREEMPTIVE_OS_QUERYREGISTRY', are as follows:

Wait Type	Wait Time (ms)
SOS_SCHEDULER_YIELD	38224
PAGEIOLATCH_SH	3512
MSQL_XP	196964
LCK_M_U	1065
LCK_M_S	30903957
IO_COMPLETION	45250.333333333336
PAGEIOLATCH_UP	8776
PAGELATCH_EX	2834
HADR_AG_MUTEX	118
BACKUPTHREAD	160
BACKUPIO	168
WAIT_ON_SYNC_STATISTICS_REFRESH	4802
HADR_SYNC_COMMIT	159082
ASYNC_NETWORK_IO	94760
WRITE_COMPLETION	8936
WRITELOG	710316
PAGEIOLATCH_EX	1465
PAGELATCH_SH	4784

Please note that the wait times are in milliseconds. The 'LCK_M_S' wait type has the longest wait time, followed by 'WRITELOG', 'MSQL_XP', 'ASYNC_NETWORK_IO', and 'HADR_SYNC_COMMIT'.

How can I reduce the wait times for LCK_M_S?

What are the best practices for managing ASYNC_NETWORK_IO waits?

Can you provide guidance on optimizing WRITELOG waits?

I want to ...

* This feature is not available for public yet.

ARC Enabled SQL Management Capabilities



Not supported



Supported



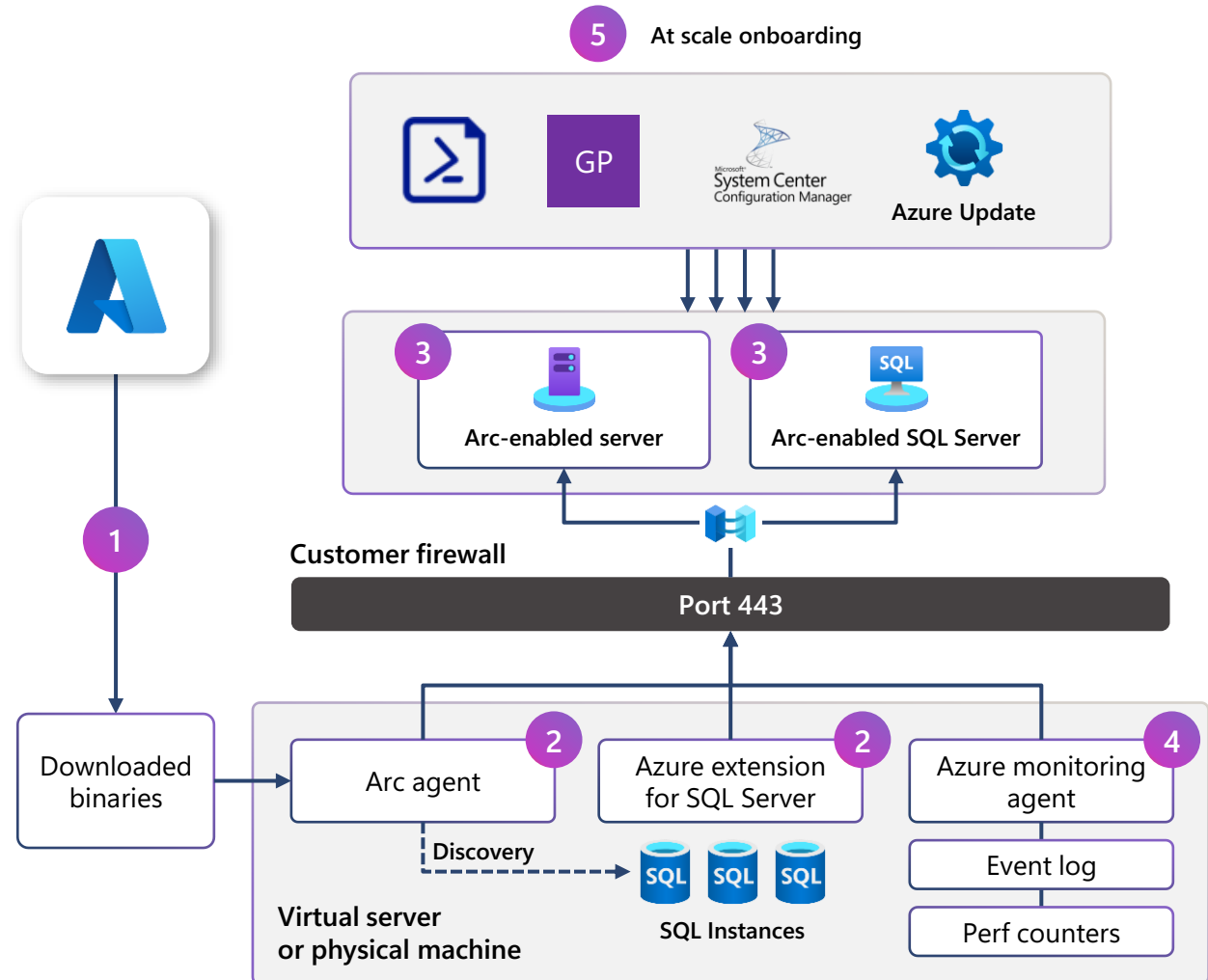
Future support

Built-in capabilities	Customer Infrastructure or 3P Clouds		Azure
	SQL Server	Arc Enabled SQL Server	SQL Server Azure VM
Pay-as-you-go billing			
Azure AD auth			
Best practices assessment			
Inventory management			
Auto patching			
Auto backup			
Monitoring			
Defender for SQL Server			
TDE with Azure Key Vault			
HA/DR inventory management			
License compliance management			
Cluster aware patching and upgrades			
Purview premium			
Point-in-time restore			
Backup long-term retention to Azure			

*Some information regarding product roadmap may be substantially modified before it's commercially released. Microsoft makes no warranties, express or implied, with respect to the information provided here.

SQL Server enabled by Azure Arc architecture

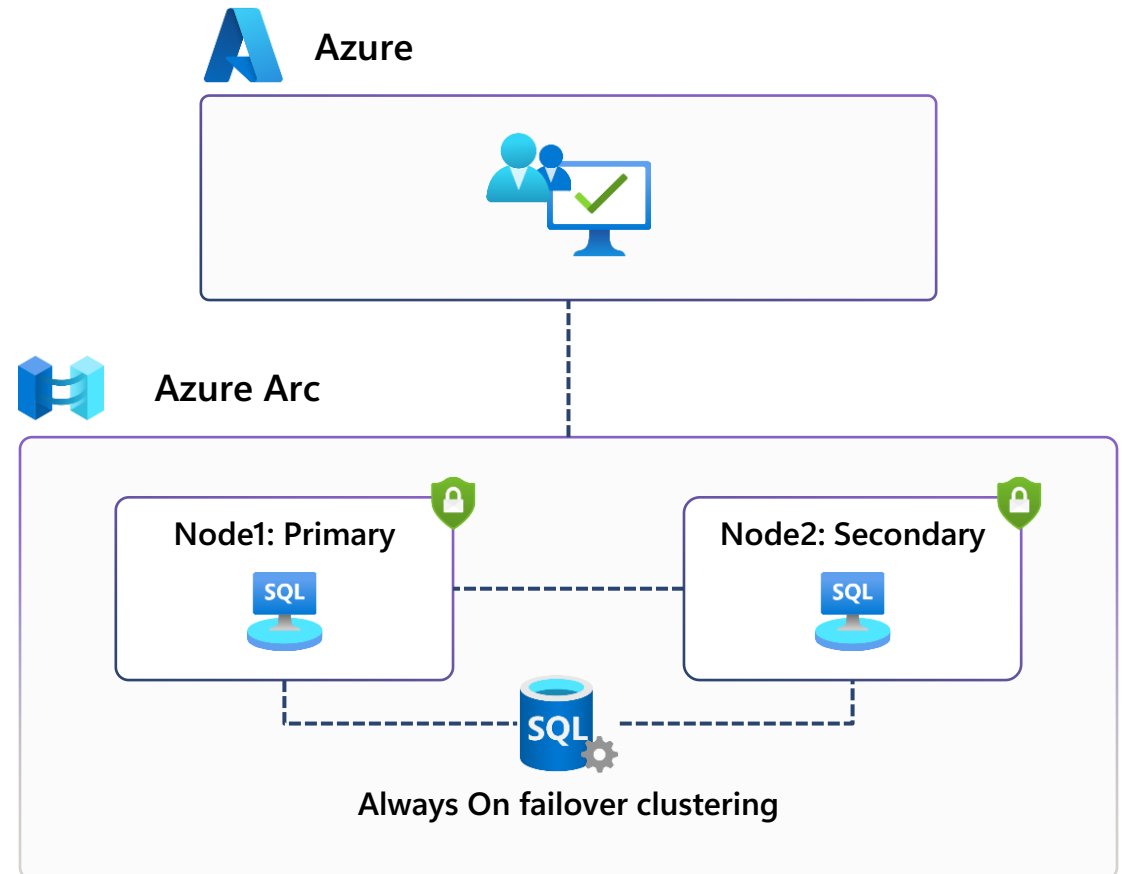
- 1 Generate script and execute on Server
- 2 Local services created
- 3 Arc-enabled server and Arc-enabled SQL Server resources created
- 4 Azure monitoring agent
- 5 Onboard at scale



Manage and configure instance-level redundancy from Azure Portal

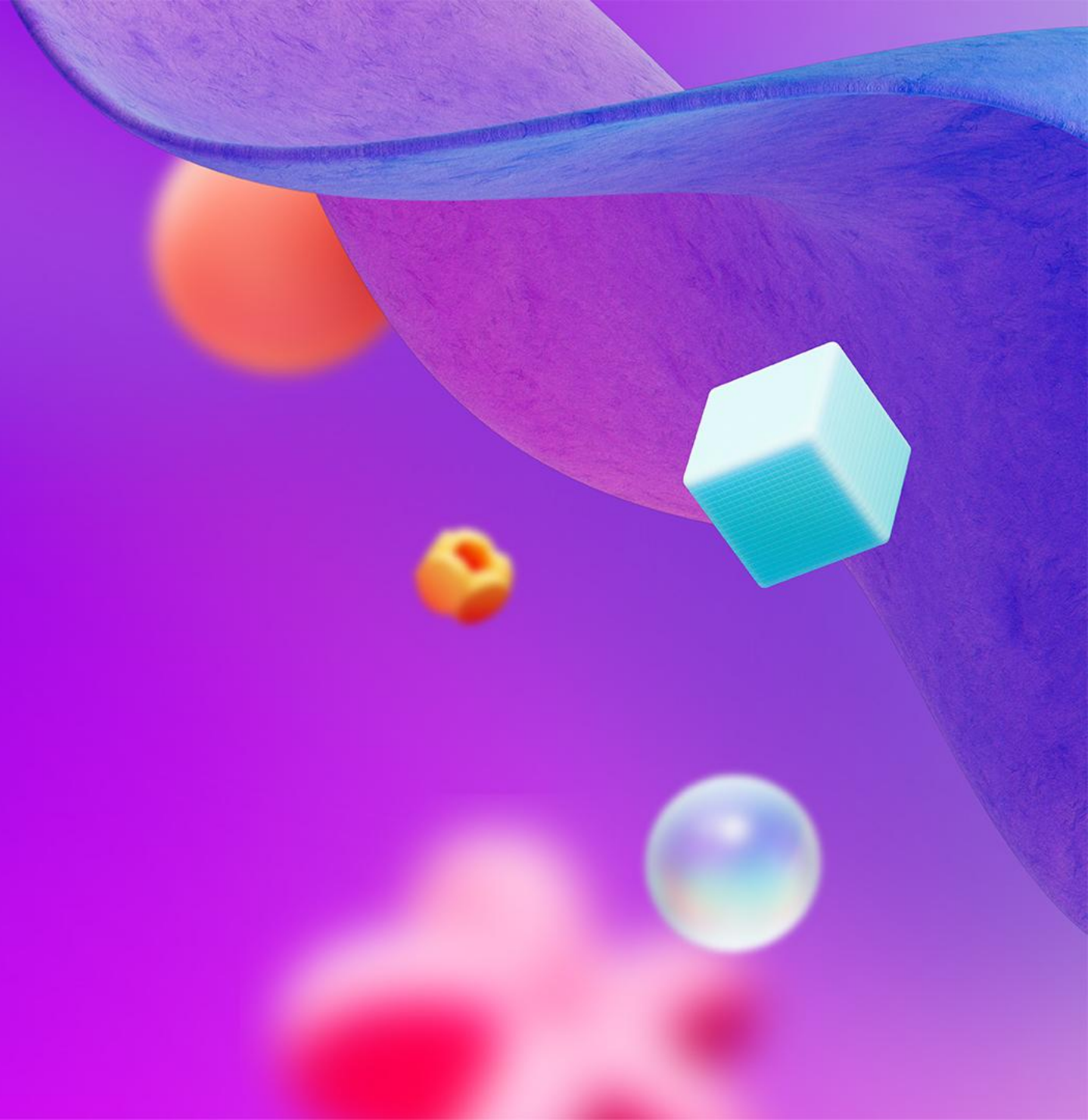
Always On Failover Cluster Instances (FCI)

- View cluster configuration, database inventory, backups
- Configure Defender against FCI to continue the threat detection and vulnerability assessments
- Don't need to use Windows Failover Cluster Manager
- Don't need to connect to the primary
- Manage all your instances from the Azure portal
- View cluster configuration, metadata, databases
- Defender status, Configure Defender

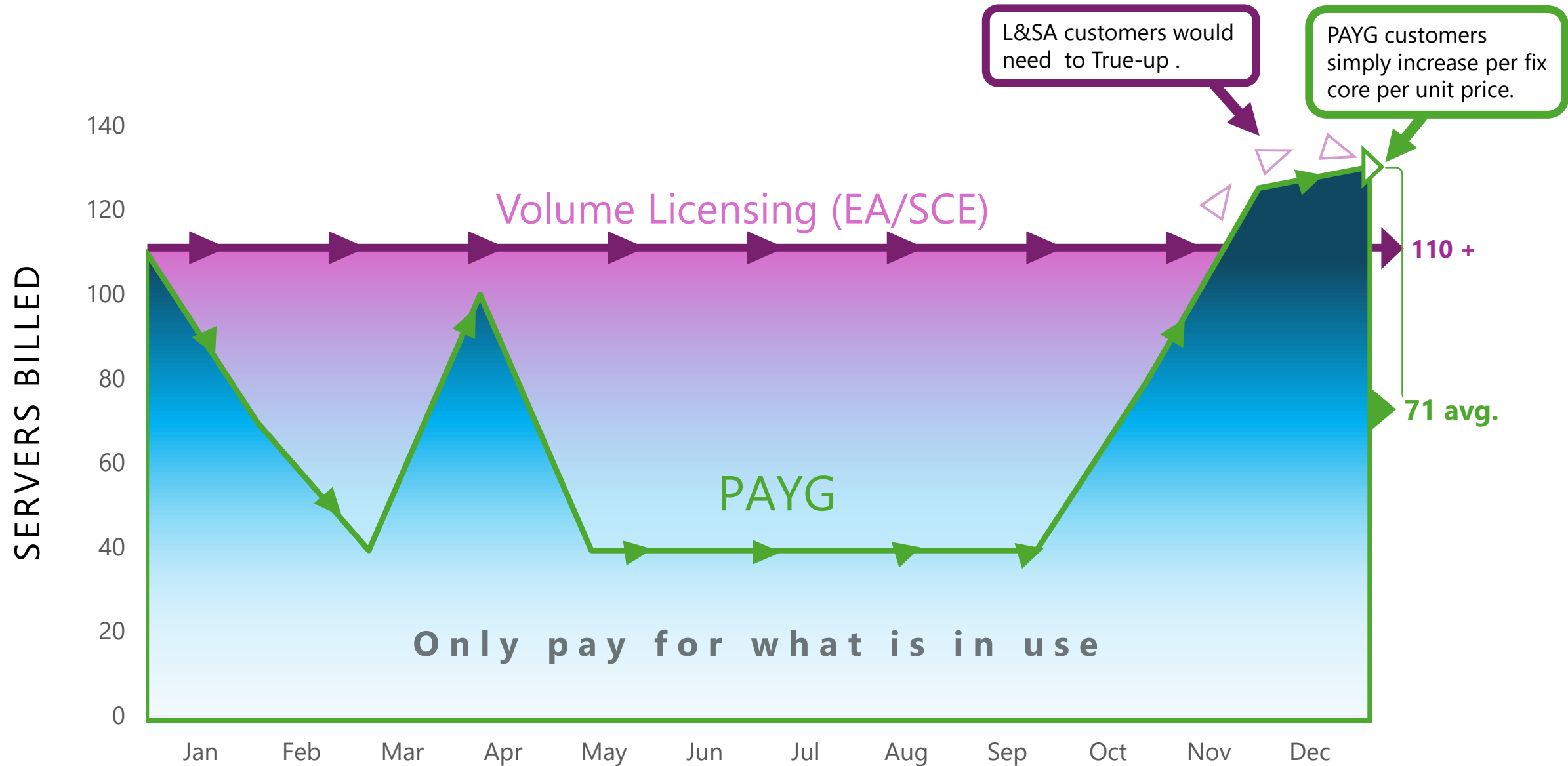


Demo

ARC Enabled SQL



Cashflow Benefits of PAYG vs VL (EA/SCE)



How to onboard SQL Server to Azure Arc

Range of different onboarding tools



SQL Server 2022 setup

Integrated UI to connect to Azure Arc during installation



Automatic registration via Azure policy

One-click action applies to all servers already connected to Azure Arc



Onboarding individual SQL Servers from Azure portal

Run auto-generated script from the target machine



Tenant scope auto-registration

Work with your account team on a consent email to allow Microsoft devops do it for you



Future – Auto-registration during the hosting server onboarding

SQL Server configuration included into the default auto-manage profile

How to select license type for SQL Server

Customer control over cost optimization



Pay-As-You-Go

- Triggers Pay-As-You-Go hourly billing after SQL Server is connected
- Enables core Arc features



Software assurance or SQL Subscription

- Provides license usage visibility in Cost management + Billing via distinct \$0 meters
- Enabled core features



License only

- Provide license usage visibility in Cost management + Billing via distinct \$meters
- Disables core features



Can alter the selection at any time

Use Azure portal or script to change between license types
Takes effect the next hour

Home > Azure Arc | SQL Servers > Add existing SQL Server instances >

Connect Azure Arc-enabled SQL Server

Microsoft

Prerequisites **Server details** Tags Run script

Azure Arc-enabled SQL Server allows you to centrally apply policies and run assessments against existing SQL Server instances running on either connected machines or via indirect connections on-premises.
[Terms of use](#) | [Privacy policy](#)

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Resource group *

Server details

Designate an Azure region where machine metadata will be stored.

Region *

Operating system *

Proxy server

If your environment requires a proxy server to connect to the internet, please specify the proxy server information below.

Proxy server URL

SQL Server management details

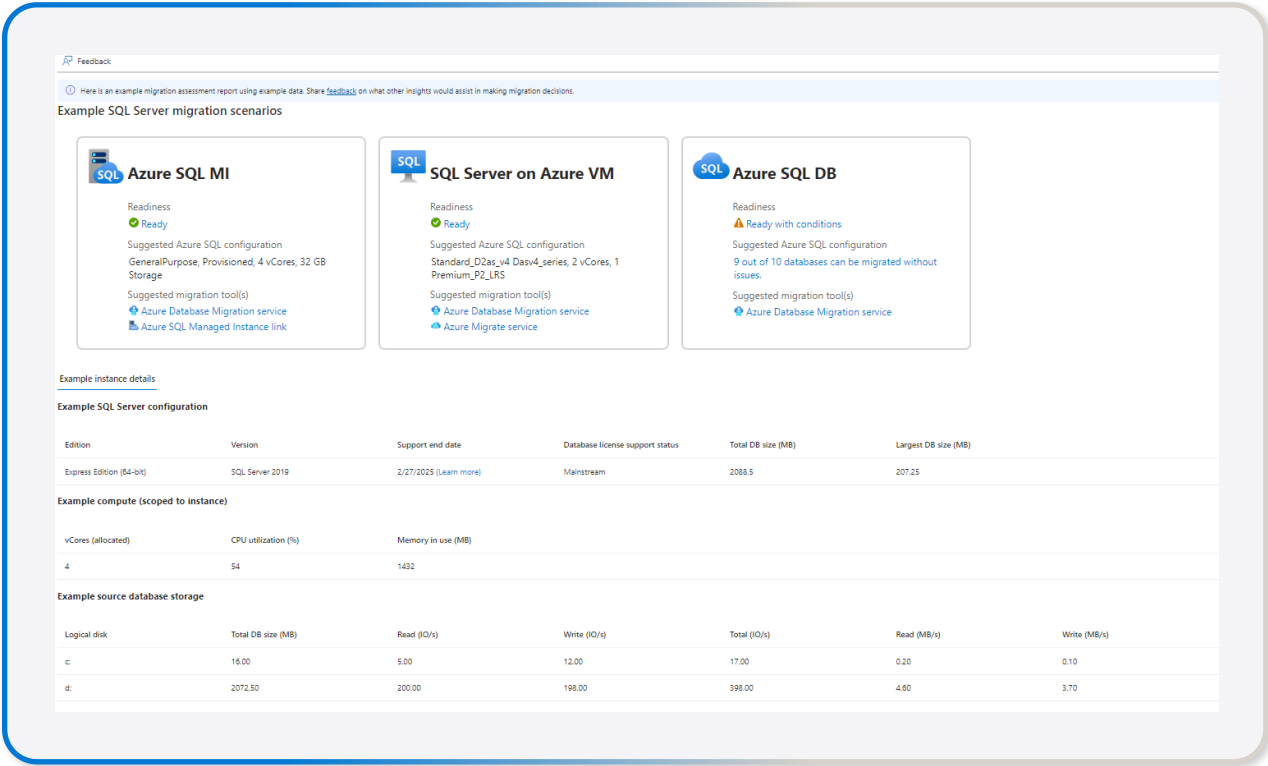
Specify the SQL Server edition and license type you are using on this machine. [Learn more](#)

License type * ☐ **PAYG** - Standard or Enterprise edition with pay-as-you-go billing through Microsoft Azure
☐ **Paid** - Standard or Enterprise edition license with Software Assurance or SQL Subscription
☐ **LicenseOnly** - Developer, Evaluation, Express, Web, Standard or Enterprise edition license only without Software Assurance

By default, all SQL Server instances on the server will be registered. To exclude SQL Server instances from registration, enter the instance names separated by space.

Excluded SQL Server instance names

NEW: SQL migration assessment in Azure Arc



Enabled by default

Assessment is baked in when customers enable SQL Server with Azure Arc

Comprehensive and actionable assessment

Evaluate and measure the readiness of SQL Servers for Azure SQL, identify migration risks with mitigation actions

Best-fit SQL IaaS/PaaS recommendations

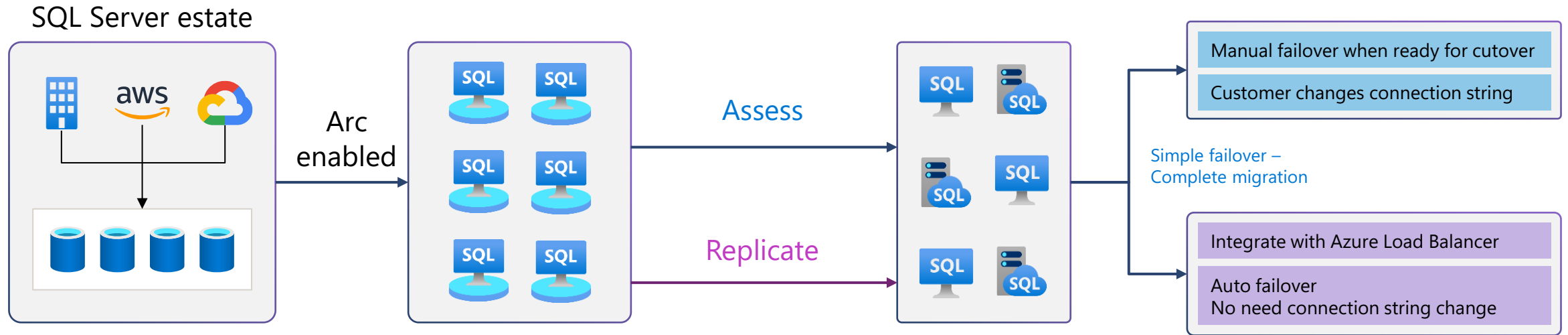
Optimize for performance and cost with guidance on service tier, sizing and migration tooling

Out of box and continuous reporting

Discovery of SQL Server and its readiness reports are instant, automatic and continuous, with zero additional setup time

Free to all customers running SQL Server anywhere
Available for all SQL Server editions, SQL Server 2012 and above

Migrate with confidence

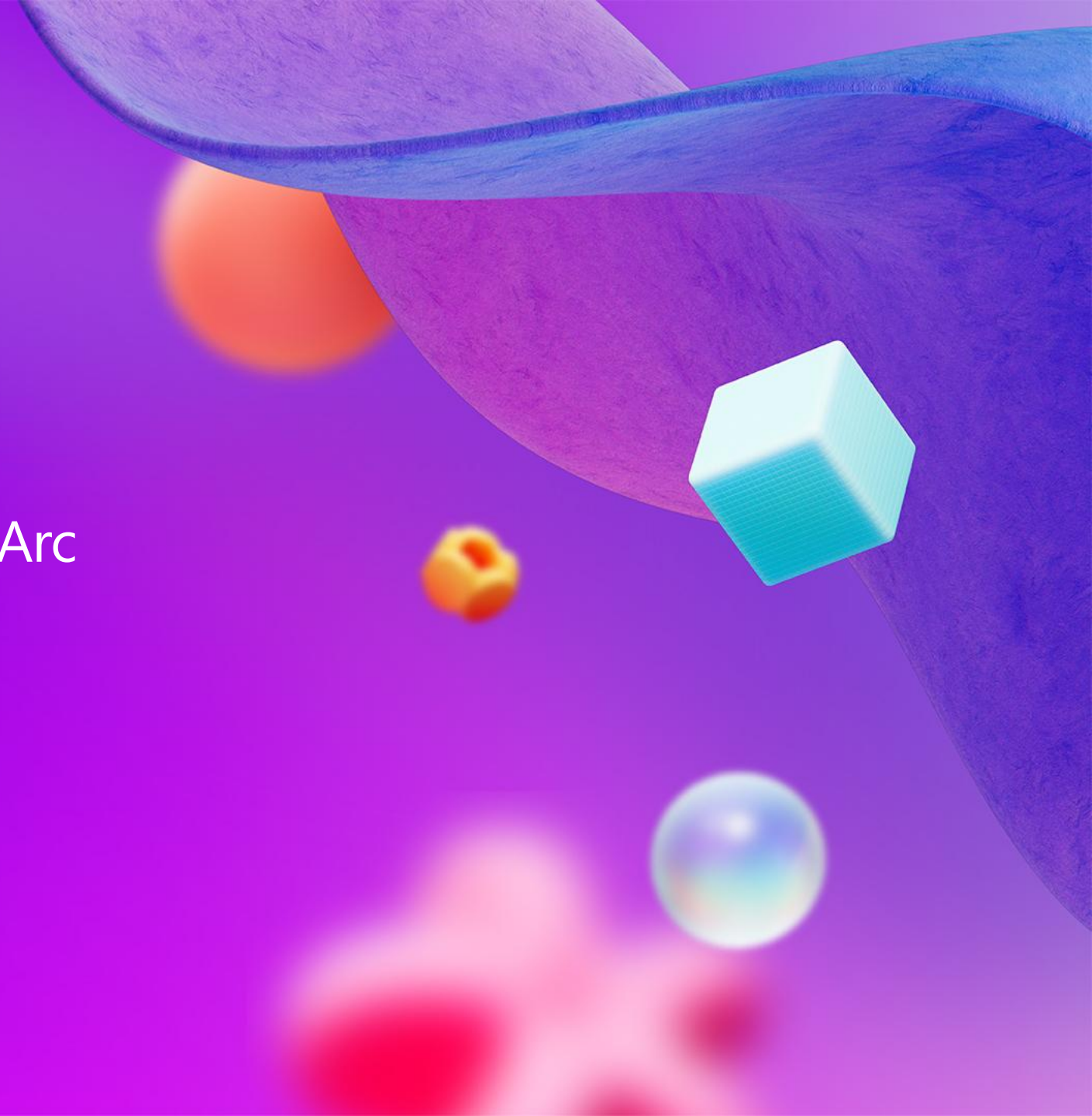


Highlights

- End to end migration fully automated
- Continuous Assessment
- Migrate at scale
- Automation of MI Link (DAG) setup and Failback
- Azure SQL SKU auto recommended based on resource usage
- Real time replication using DAG and Migrate using Backups

Demo

End to End migration journey in Arc



Home > Azure Arc

Azure Arc | SQL Server instances

Search

SQL Server instances Migration Center

Overview

All Azure Arc resources

> Azure Arc resources

> Host environments

> Data services

SQL Server instances

SQL managed instances

PostgreSQL instances (preview)

Data controllers

> Internet of Things (IoT)

> Application services

> Licenses

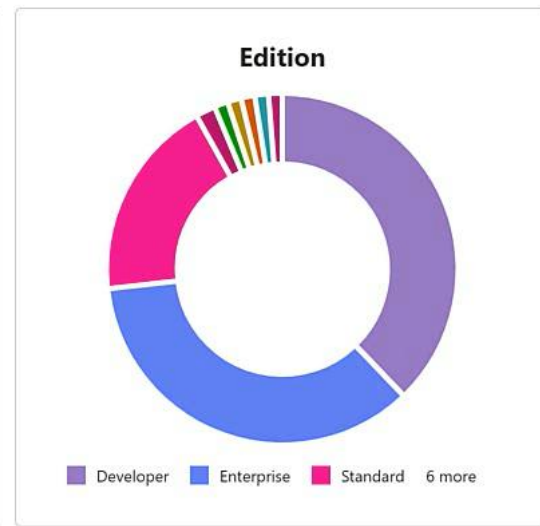
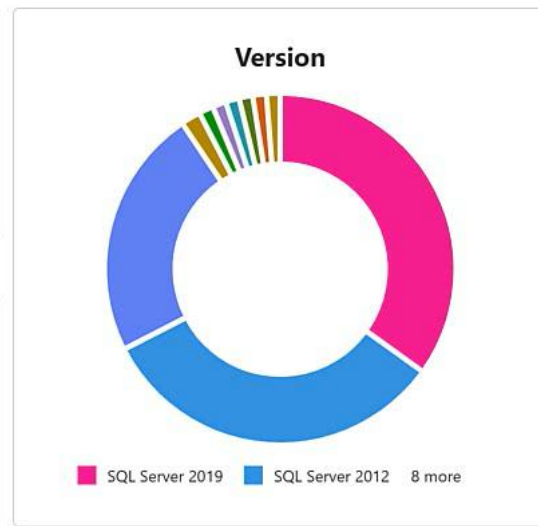
> Management

> DevOps

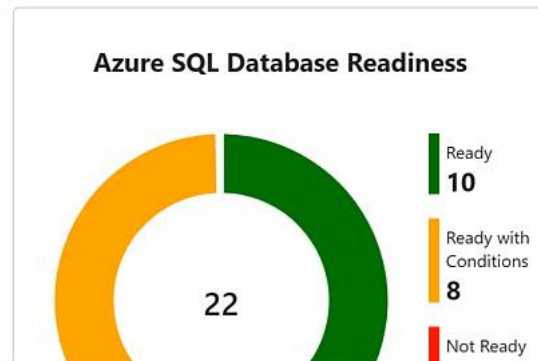
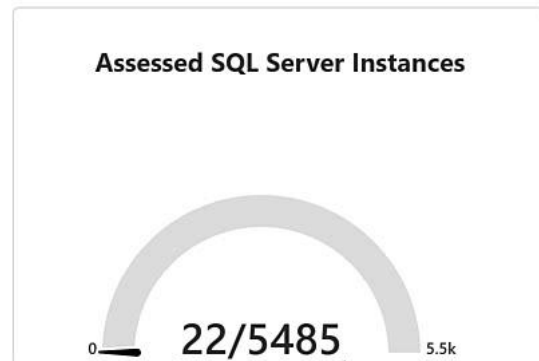
Refresh Instance Details

Subscription == ADS TINA Engineering

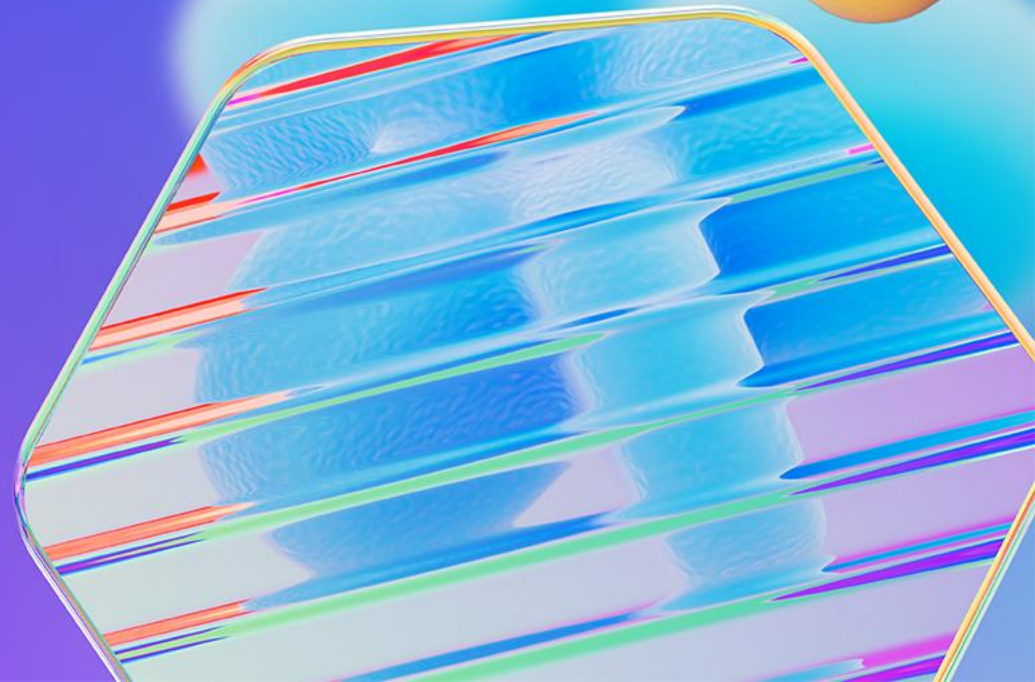
Add filter



SQL Server Migration Assessment



Today's agenda





Agenda



How to accelerate your AI journey



Introduction to Azure Data Services



Reasons to Modernize



Migration Tools and Techniques



Agenda



Migrating SQL Workloads to Azure SQL



Migrating PostgreSQL Workloads to Azure PostgreSQL Flexible Server



Leveraging AI capabilities in your modern data workload



Hands-on experiences / Final Remarks