Azure Database Migration

What is Azure Database Migration?

Database Migration to Azure refers to the process of moving your existing databases from an on-premises environment, or another cloud provider, to Microsoft Azure. This involves transferring data, schema, and associated database objects to Azure-based database services such as Azure SQL Database, Azure SQL Managed Instance, or Azure Cosmos DB.

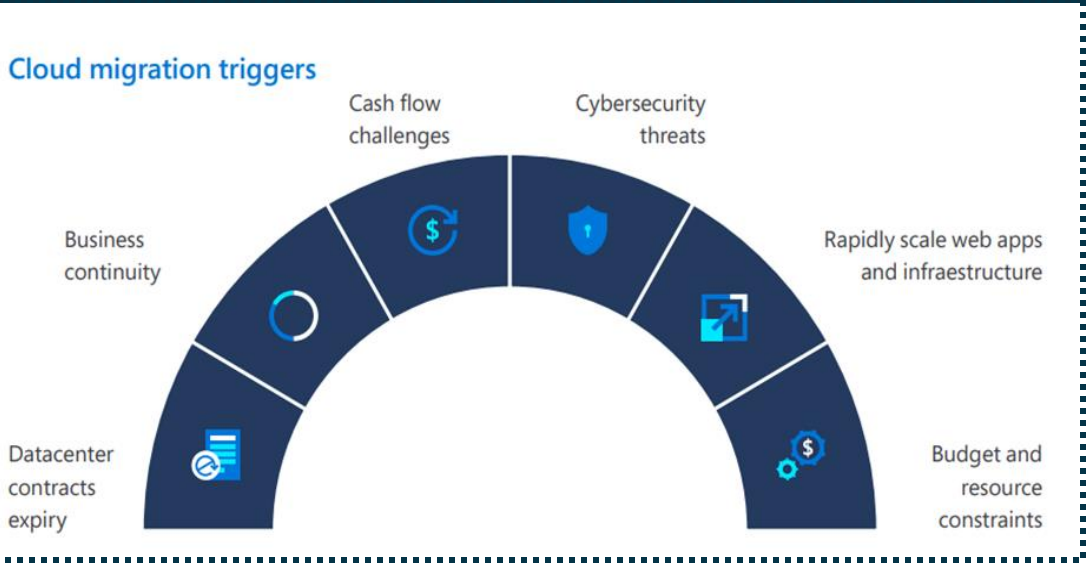
Here are some key aspects of Database Migration to Azure:

Assessment: Utilize tools like Azure Migrate to assess your on-premises databases for compatibility and performance considerations before migration.
Migration Methods: Choose between offline (downtime during migration) or online (minimal downtime) migration methods based on your business requirements.
Security: Implement Azure's advanced security features to protect data during the transfer process and when stored in Azure.
Performance Tuning: Post-migration, leverage Azure's built-in performance tuning features to optimize database operations.
Cost Management: Take advantage of Azure's cost management tools to monitor and control your spending post-migration.
Scalability: Azure provides the flexibility to scale your database resources up or down based on demand, ensuring efficient resource utilization.
Integration: Azure offers seamless integration with other Azure services, enhancing the capabilities of your migrated databases.
Support for Multiple Database Types: Azure supports a wide range of database types, including relational and non-relational databases.
Continuous Updates: Azure services are continuously updated, providing you with the latest features and improvements without manual intervention.
Global Reach: Azure's global infrastructure allows you to deploy your databases in data centers around the world, reducing latency for global users.

Why is Database Migration Required

Challenges faced by existing on-Prem customers?

- Scalability Bottlenecks , Operational Overhead
- Agility Constraints , Security Vulnerabilities
- Disaster Recovery Limitations, Innovation Hurdles
- Performance Challenges , Versioning Concerns
- Integration Issues , Limited Analytics Capabilities
- Compliance Complexities, Vendor Lock-In
- Skill Shortages



How do customers benefit from Migrating Database to Azure

- Increased Scalability and Flexibility
- Multi-fold operational Efficiency
- Embracing power of cloud Native technologies
- Improved Security Posture
- Ensuring 99.99% of Business Continuity
- Effective integration techniques
- Overcoming Performance Bottlenecks
- Long-Term Cost Predictability & Cost optimization
- Faster and wider Global reach
- Risk Mitigation
- Managing Software Updates and Upgrades
- Navigating Regulatory Requirements
- Avoid Dependency on Specific Technologies
- Democratization of Azure technologies
- AI and ML Integration

These capabilities enhance the overall efficiency and intelligence of database management systems in the cloud.

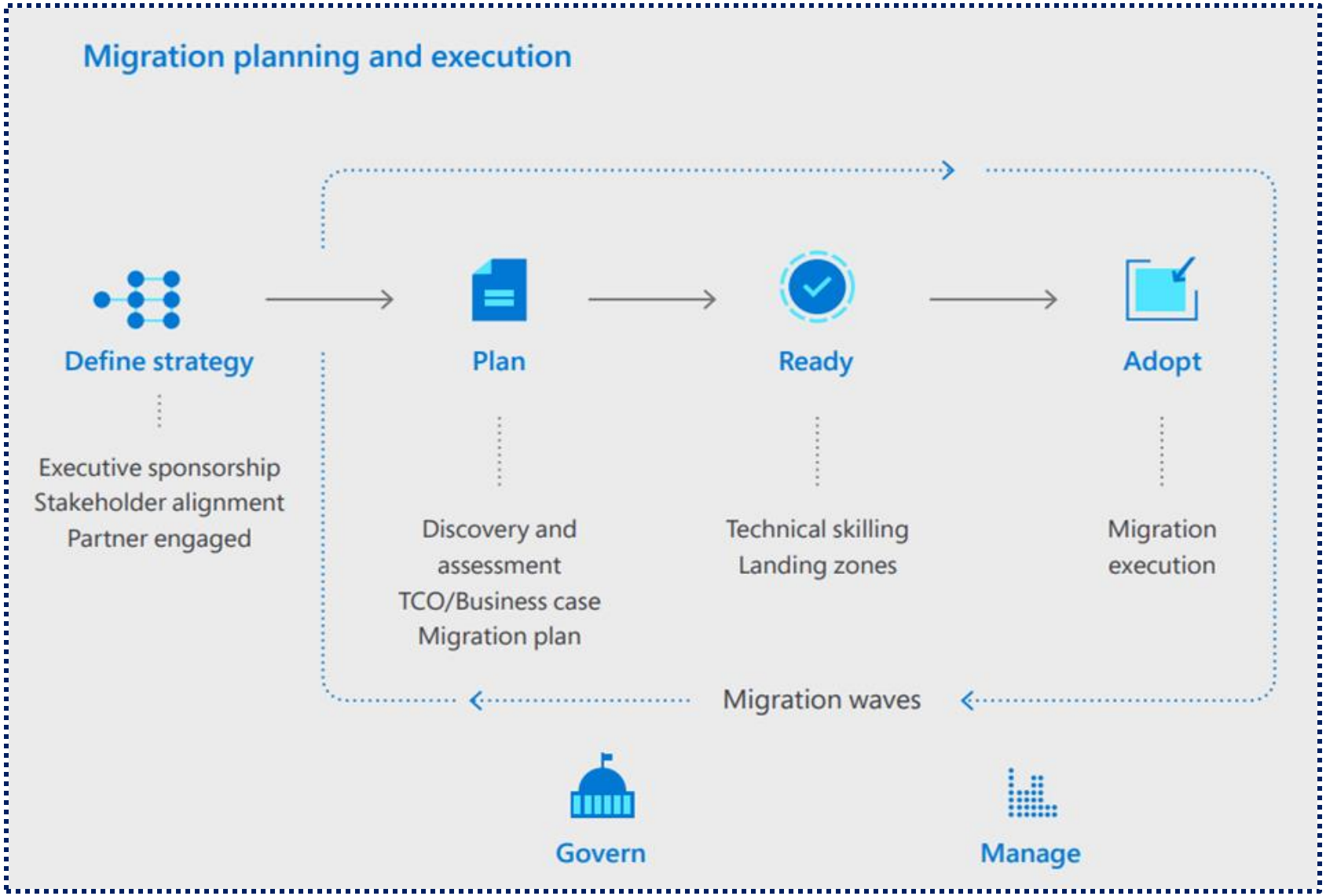
Azure Migration Focus Areas

Cloud Adoption Framework (CAF)

consolidates best practices from Microsoft and others, offering tools and guidance to shape technology and business strategies, driving desired outcomes in adoption efforts.

Each methodology contributes to the cloud adoption lifecycle, supported by the Cloud Adoption Framework (CAF) throughout each phase of the journey.

The framework utilizes methodologies to address common blockers, as depicted in the following diagram.



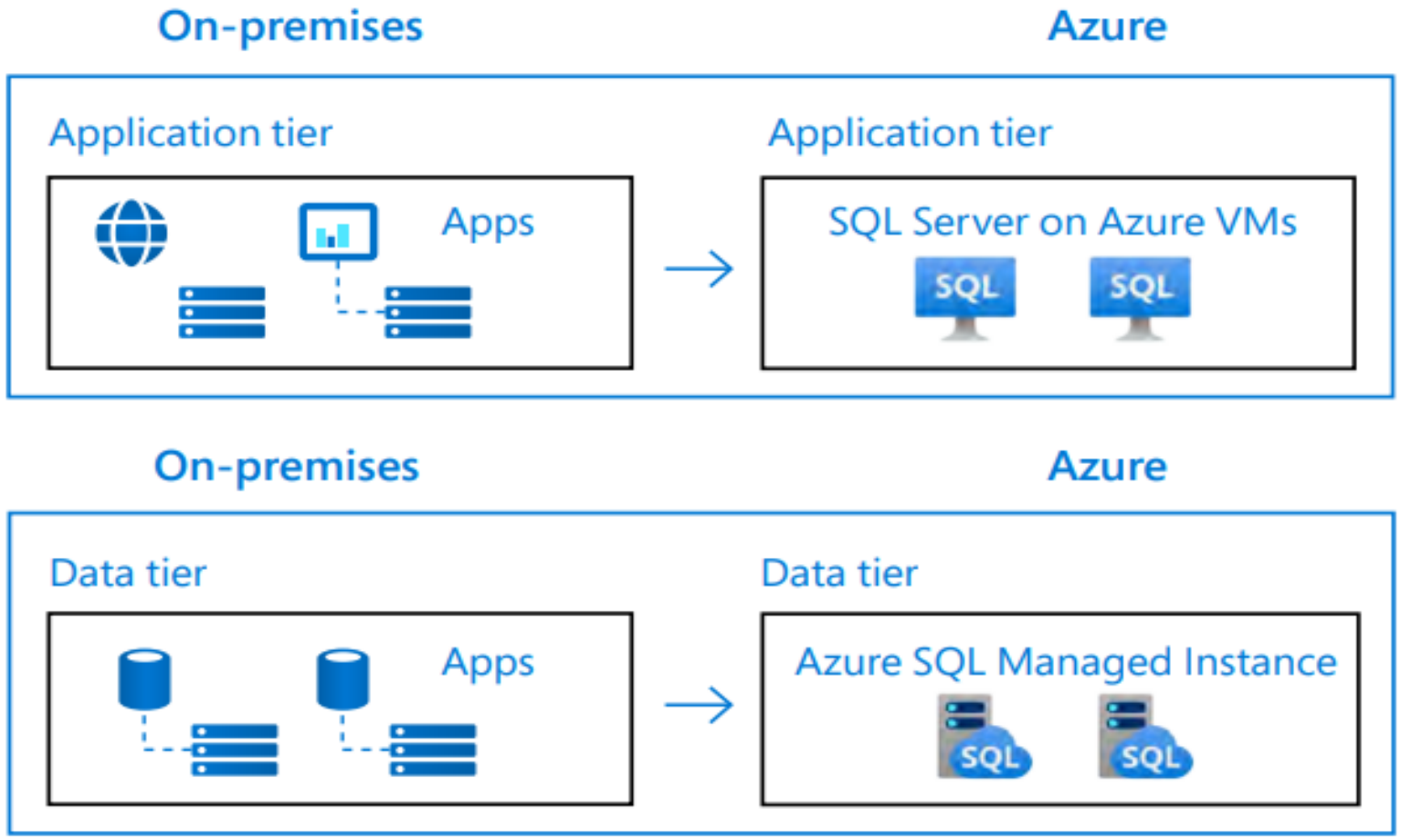
Azure Migration (Cloud Adoption Journey – Phase wise approach)

Migration stages	Sub phases	Tasks Summary
Define Migration Strategy	Define business justification	We will be migrating databases to Azure effectively by first clearly defining the business rationale, considering factors like cost savings, efficiency, and compliance requirements. We will set specific SMART goals and evaluate your digital estate to prioritize databases based on their readiness and business impact. We will ensure our team is equipped with the necessary skills and training for Azure technologies. We will decide on the migration approach for each database, considering options like rehosting or refactoring. We will estimate costs and ROI using Azure tools while identifying and mitigating potential risks. Finally, we will develop a realistic timeline and engage stakeholders to ensure alignment and address any concerns, ensuring a smooth migration process.
	Establish migration goals	
	Assess digital estate	
	Prioritize workloads for migration	
	Plan for skills and training	
	Determine migration approach	
	Calculate costs and ROI	
	Identify risks and mitigation strategies	
	Develop a timeline	
	Engage stakeholders	
Migration Plan	Prepare your landing zone for migration	To ensure a smooth migration process, we will start by preparing your landing zone to support migration activities, understanding the components required for success. We will then select the appropriate tools and establish an initial migration backlog derived from your digital estate planning to prioritize tasks effectively. Next, we will decide on Azure regions for migration, considering factors like compliance and data residency. We will define clear roles and responsibilities for stakeholders, project managers, and technical leads involved in the migration project.
	Prepare tools and an initial migration backlog	
	Select Azure regions for migration	
	Align roles and responsibilities	
	Incorporate skills readiness for migration	
Getting Ready for Migration/ Pre-Migration	Document naming and tagging standards	To optimize your Azure setup, we will establish a naming convention and documentation standards for resource consistency. We will utilize IaC modules and filter the registry for efficient Cloud Adoption Framework implementation. We will deploy an enterprise-scale landing zone and set up a data management zone for governance. Furthermore, we will expand with data components and streamline deployment using Azure DevOps templates.
	Use IaC modules	
	Filter the IaC registry	
	Deploy an enterprise-scale landing zone	
	Set up a data management zone	
	Expand your landing zone with data	
	Build your data management and landing zone	

Azure DataBase Migration (Cloud Adoption Journey – Phase wise approach)

Migration stages	Sub phases	Tasks Summary
Cloud Adoption phase/ Actual Migration	Classify workloads	We will prioritize workload classification and readiness assessment for migration and architect scalable and secure Azure solutions, deploying necessary services. Additionally, we will remediate and replicate databases while ensuring data integrity. Thorough testing will be conducted, and changes will be communicated before finalizing migration. We will then optimize costs and conduct retrospectives for continual improvement.
	Evaluate workload readiness	
	Architect workloads	
	Deploy supporting services	
	Remediate assets	
	Replicate assets	
	Prepare for management	
	Test the migration	
	Begin change communication	
	Conduct business testing	
	Complete the migration	
	Optimize costs after migration	
	Conduct retrospectives	
Post Migration (Govern, Secure, Manage)	Assess workloads, Monitor & improve the performance, cost, operational efficiency, Security, Reliability (5 pillars of Well Architected Framework)	As part of the Azure Post Migration phase, we engage in a series of crucial activities to ensure a smooth transition for our customers. we assess workloads for cost, modernization, and tooling, ensuring security by managing traffic and deploying encryption. We monitor resource usage with and replicate workload functionality in the cloud, followed by rigorous testing and optimization for ongoing operation.
	Release Workloads	

Sample Architect picture of Database Migration



Cloud migration involves two separate aspects:

Migrating the application and its associated database.

It's essential to make independent migration decisions for each component to fully optimize the workload.

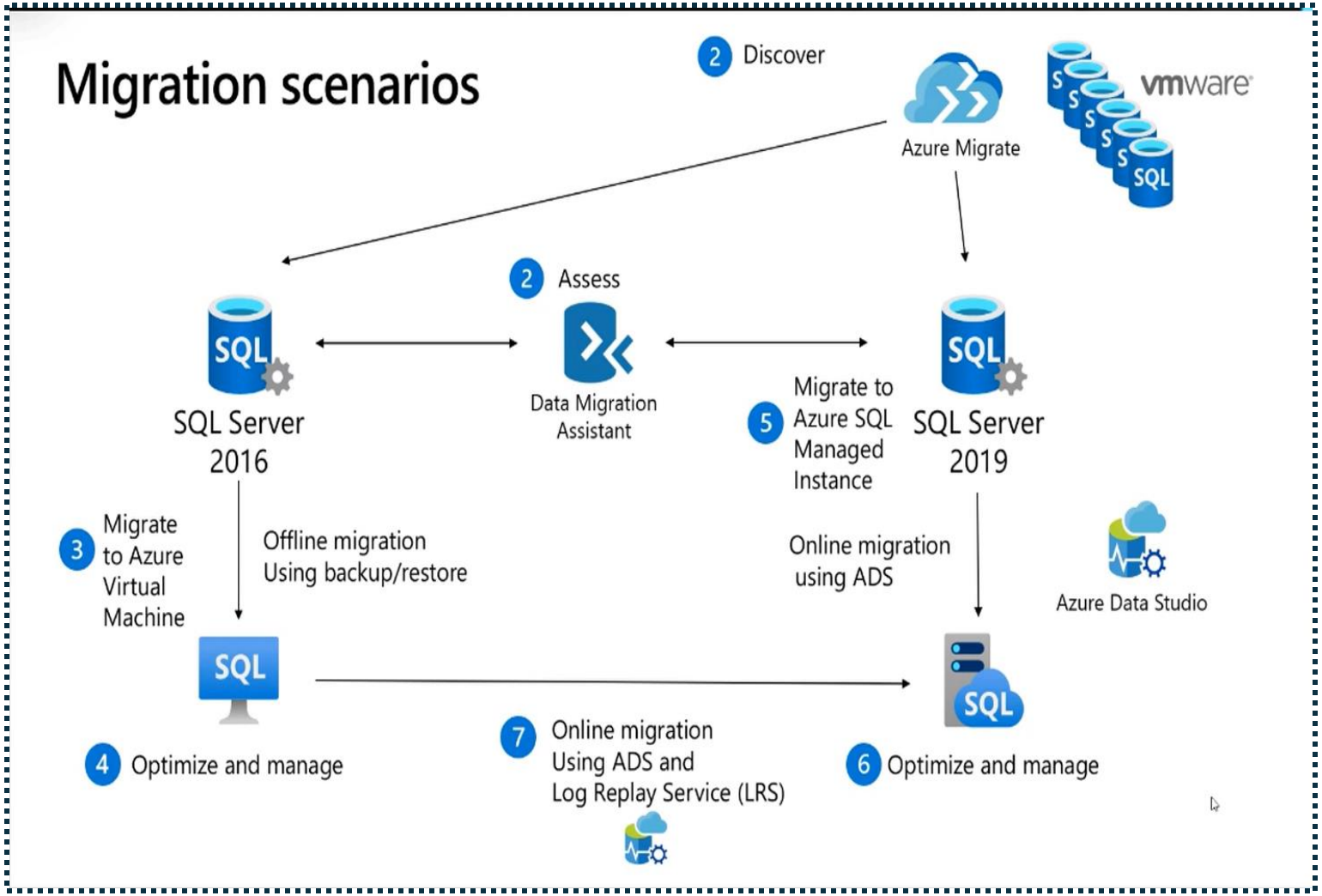
Image source: Microsoft

Database Migration from On-prem to Azure
Saxon's Approach & Timelines

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
5 to 7 days	2 to 4 weeks	2 to 4 weeks	4 to 8 weeks	2 to 4 weeks
Define Migration Strategy	**Migration Planning**	**Getting Ready for Migration / Pre-Migration**	**Cloud Adoption phase/ Actual Migration**	**Post Migration (Govern, Secure, Manage)**

Disclaimer : These Timelines vary depending on the Architecture portfolio of the customer's environment , Viz. # of Servers, Workloads, Data volume, Dependencies etc.

Database Migration Scenarios

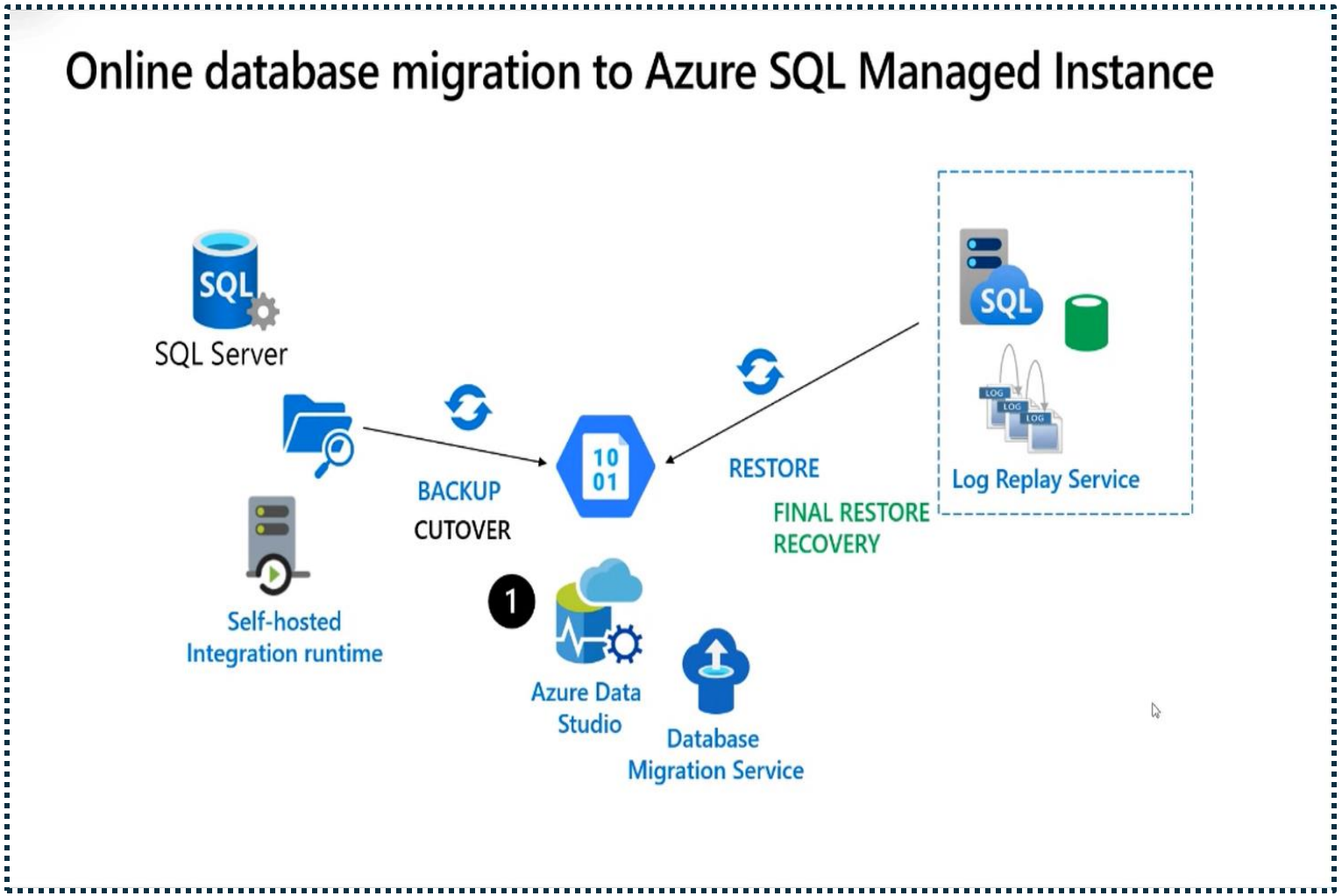


Scenarios usually begin in preview and, following assessment and potential adjustments, progress to general availability (GA). GA scenarios are fully operational and accessible to all users.

Azure DMS facilitates migrations from diverse sources to Azure data platforms. For instance, migrations from SQL Server and Amazon RDS SQL Server to Azure SQL Database, Azure SQL Database Managed Instance, and Azure SQL VM are supported and have achieved GA status..

Image: Microsoft

Database Migration Scenarios

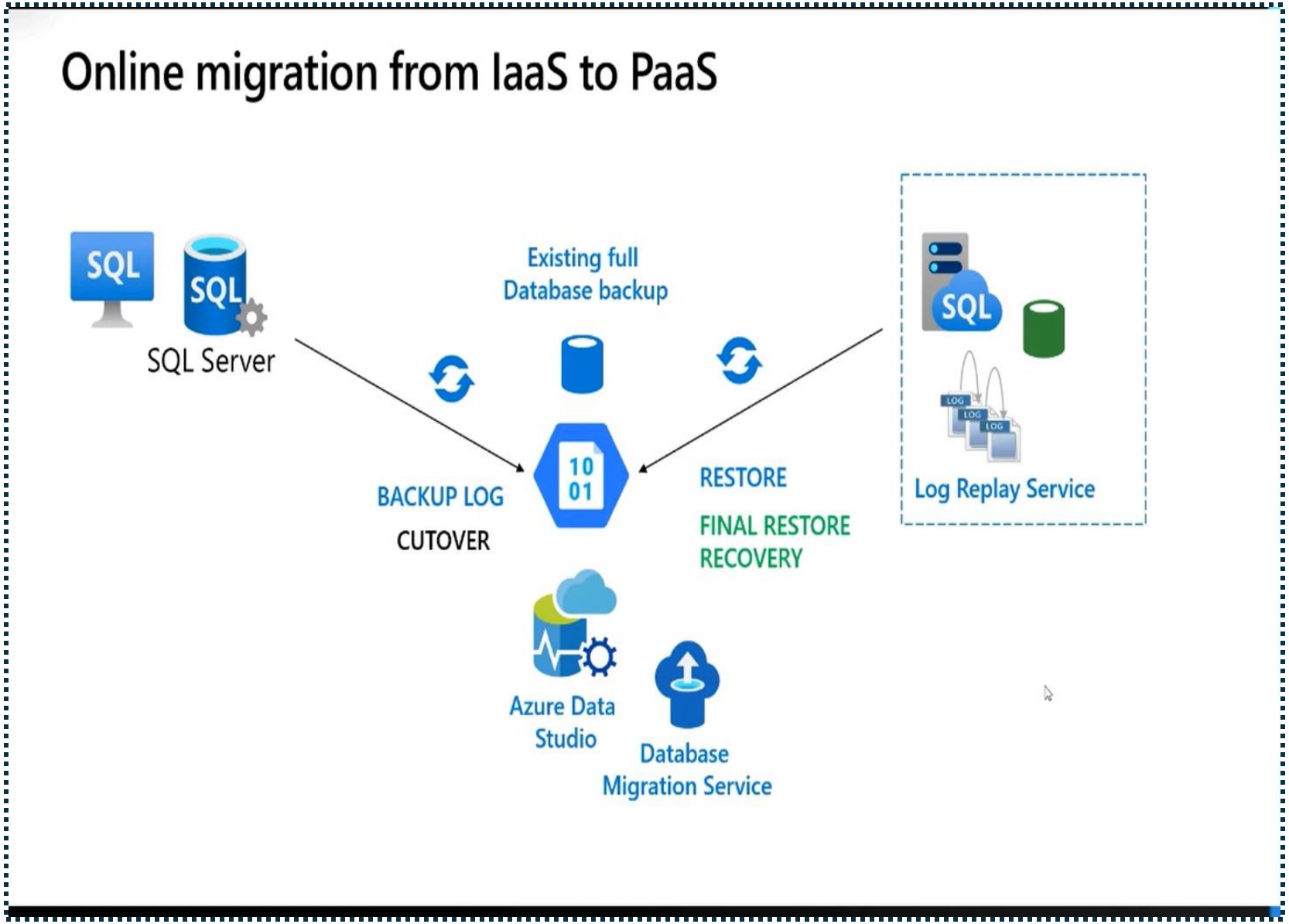


Online migrations (minimal downtime) through the Azure SQL Migration extension for Azure Data Studio are supported for Azure SQL Managed Instance and SQL Server on Azure Virtual Machines targets.

For more information, see Migrate databases by using the Azure SQL Migration extension for Azure Data Studio

Image: Microsoft

Database Migration Scenarios



Online database migration from IaaS to PaaS is about moving your self-managed databases to a managed service like Azure SQL Database. This helps you focus more on development and less on maintenance.

The process includes assessing your current setup, planning the move, using migration tools for a smooth transition, and optimizing performance after the move. It is designed to keep your services running with minimal downtime during the switch.

Image: Microsoft

Saxon's Deliverables of Database Migration

Deliverables

- ✓ **Project Plan**: A detailed plan outlining the scope, timeline, resources, and steps involved in the migration process.
- ✓ **Assessment Report**: Documentation of the current database environment, including an inventory of the data sources, applications, and dependencies.
- ✓ **Migration Strategy Document**: A comprehensive strategy that includes the migration approach, tool selection, and risk mitigation plans.
- ✓ **Testing Plan**: A plan that details the testing methodologies, scenarios, and acceptance criteria to ensure the migration is successful.
- ✓ **Migration Scripts/Tools**: Custom scripts or tools developed or utilized for the migration process.
- ✓ **Data Mapping Document**: A document that outlines how data from the source environment will map to the target Azure environment.
- ✓ **Security Plan**: A plan to ensure that data remains secure during and after the migration, including compliance with relevant regulations.
- ✓ **Rollback Plan**: A contingency plan in case the migration needs to be reversed.
- ✓ **Training Materials**: Documentation and materials to train staff on the new Azure environment and any new processes.
- ✓ **Final Migration Report**: A report detailing the migration process, any issues encountered, and how they were resolved.
- ✓ **Post-Migration Optimization Plan**: Recommendations for optimizing the database performance in the new Azure environment.

About Us

Saxon is a data and analytics company specializing in industry-specific solutions to make organizations more insights-driven. It helps in empowering clients with actionable information for real-time decision-making, serving as a key solution partner to leading data engineering & Cloud Technology platforms, supporting diverse industries in their digital transformation journey.

Saxon has been the Trusted Partner over 2 decades for holistic business transformation: Industry Insights, Consulting Excellence, and Cutting-Edge Cloud & AI Solutions

THANK YOU