Modernizing your Microsoft SQL Server environment

Optimize operations and unleash the power of your data—on the premises or in the cloud.

NetApp

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Why now?

For the more than 10,000 customers running older, unsupported versions of SQL Server, the pressure to modernize their environment is even greater as the application their businesses rely on reaches end-of-support. Operating without support puts the business at greater risk for security breaches, reduces the organization's ability to meet compliance regulations, and increases maintenance costs.

Preparing for the future, today
Organizations across all industries depend on Microsoft SQL Server databases to support the enterprise applications that are the backbone of their business. As companies around the globe become increasingly data driven, IT staff is under pressure to quickly extract value from business-critical SQL Server data, no matter where it is produced or where it resides—across on-premises, edge, and cloud environments.

To maintain a competitive edge, organizations must provide predictable, high levels of performance and availability for their SQL Server data, even in the face of shrinking budgets. Database bottlenecks cannot be tolerated. As IT struggles to meet SLAs for performance and availability, they also face increasing pressure to support existing and emerging applications. They are torn between migrating to a modern infrastructure and renewing costly maintenance contracts on legacy storage.

This e-book explores the considerations and options for upgrading your Microsoft SQL Server database environment in the cloud and on your premises.

# Key considerations for modernizing your SQL Server environment

The primary goal of a database system is to promote efficient data manipulation while maintaining data integrity and security. Whether you're deploying on your premises or in the cloud, your storage must deliver on many fronts to be as effective as possible. These are the most crucial features and capabilities that your storage environment must support.

Performance. Because almost all database operations involve reading or writing data, I/O performance determines the speed at which a database can operate. Having a storage solution that consistently delivers high IOPS and low latency is key to achieving efficiency goals.

Reliability. Because the storage environment is an integral part of the database platform, it must be available for sustained access by database servers without fail. If access to the storage is interrupted, database operations might come to a halt, potentially causing a major disruption for all dependent applications and systems.
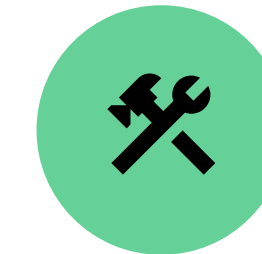
Durability. When a database system is ACID (atomicity, consistency, isolation, and durability) compliant, it means that the system can guarantee that when a database transaction has been committed, the data is durable. That is, it will survive a failure. Storage environments must ensure adequate data redundancy to protect against failures.

Security. Organizations with strict requirements for data storage require features such as encrypted transport and data encryption at rest. These features are necessary to protect sensitive data, such as personal, financial, and healthcare information.

Disaster recovery. Database storage that can withstand a severe outage without data loss (RPO=0) presents enormous value to database administrators who are setting up disaster recovery systems. Applications can continue operating after failover with minimal downtime, allowing businesses to remain operational in the worst-case scenario, and ideally with RTO < 60 seconds.
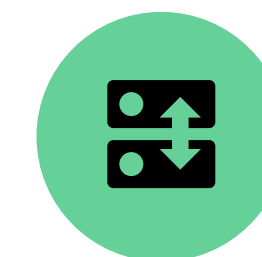
Cloning. A clone of a database system is often required to perform testing, such as for a database upgrade or an application deployment. The ability to instantly clone existing storage volumes and quickly create temporary, writable, and up-to-date copies of large production databases, without any adverse effects to the live environment, is a big win for DevOps engineers, software developers, and database administrators.

To cloud or not to cloud?

As business and technology evolve, change is inevitable. For many companies, that change comes in the form of mandates that IT infrastructure and services must live in the cloud. But moving critical applications to the cloud isn't always easy.
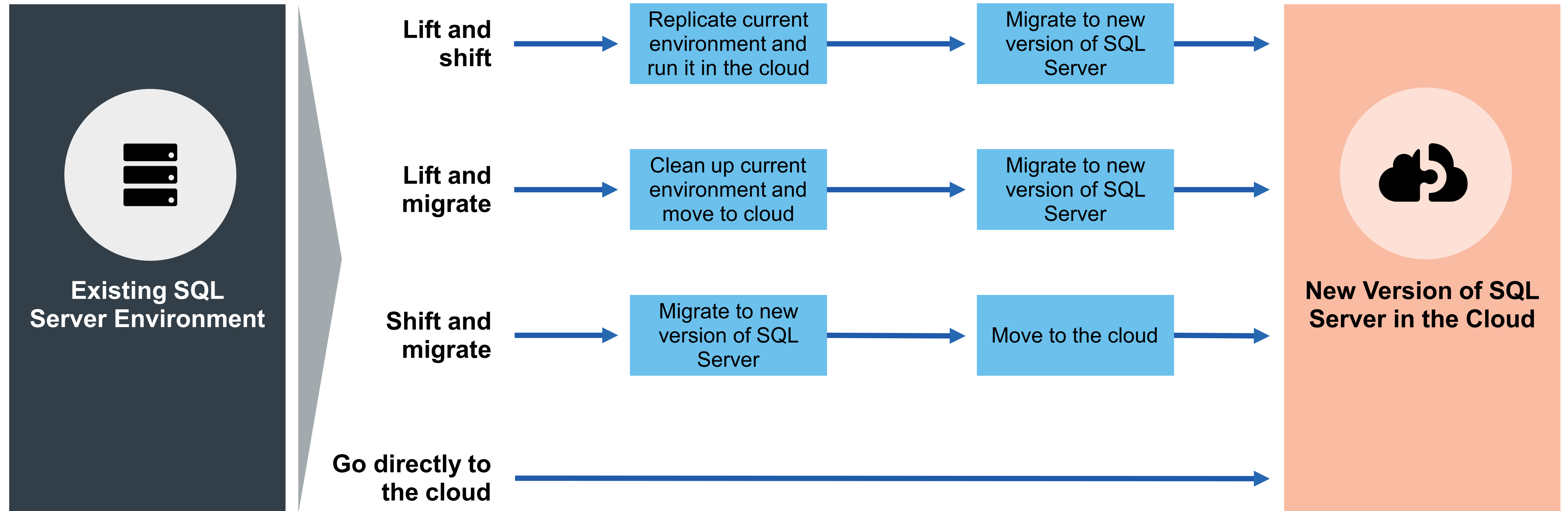
Reach for the cloud
Aging infrastructures and software, along with cloud mandates, mean that many infrastructure teams are scrambling to find a way to move to the cloud and avoid business risks while retaining the enterprise protections that their operations rely on. Because many organizations have a custom infrastructure, achieving a complete cloud experience is challenging and requires a significant amount of manual building and configuration. When complexity and management overhead are introduced to your cloud deployment, the risk of downtime increases and many of the benefits of moving to the cloud are negated.

Finding the right path to the cloud can help reduce risks and simplify the migration process. There are four main paths to move your SQL Server environment to the cloud:

- **Lift and shift.** Replicate your current environment (including the old architecture) and start running it in the cloud.

- **Lift and migrate.** Clean up your current environment, update patches, delete garbage, and move the cleaned-up architecture to the cloud. Then start the process of building and migrating to an updated SQL environment in the cloud.

- **Shift and migrate.** Transition to a new version of SQL Server first and then convert to SQL Server in the cloud.

- **Go directly to the cloud.** Move to the cloud and transition to a new version of SQL Server in the process.

Four key paths to the cloud

Existing SQL Server Environment

Lift and shift → Replicate current environment and run it in the cloud → Migrate to new version of SQL Server →

Lift and migrate → Clean up current environment and move to cloud → Migrate to new version of SQL Server →

Shift and migrate → Migrate to new version of SQL Server → Move to the cloud →

Go directly to the cloud →

New Version of SQL Server in the Cloud

Keep your SQL Server data on your premises

Even with the promise of simplicity and agility, many organizations are hesitant to move their business-critical applications to the cloud. Because cloud infrastructure typically does not have enterprise data management capabilities, IT departments are concerned about performance limitations, security, compliance, and data loss.

By modernizing your on-premises infrastructure with a data fabric, you can maintain complete control over your SQL Server data, while allowing easy migration to the cloud when you're ready, and back on your premises if needed. A data fabric provides consistent capabilities, such as cloning, snapshot copies, and more, across on-premises and cloud resources.
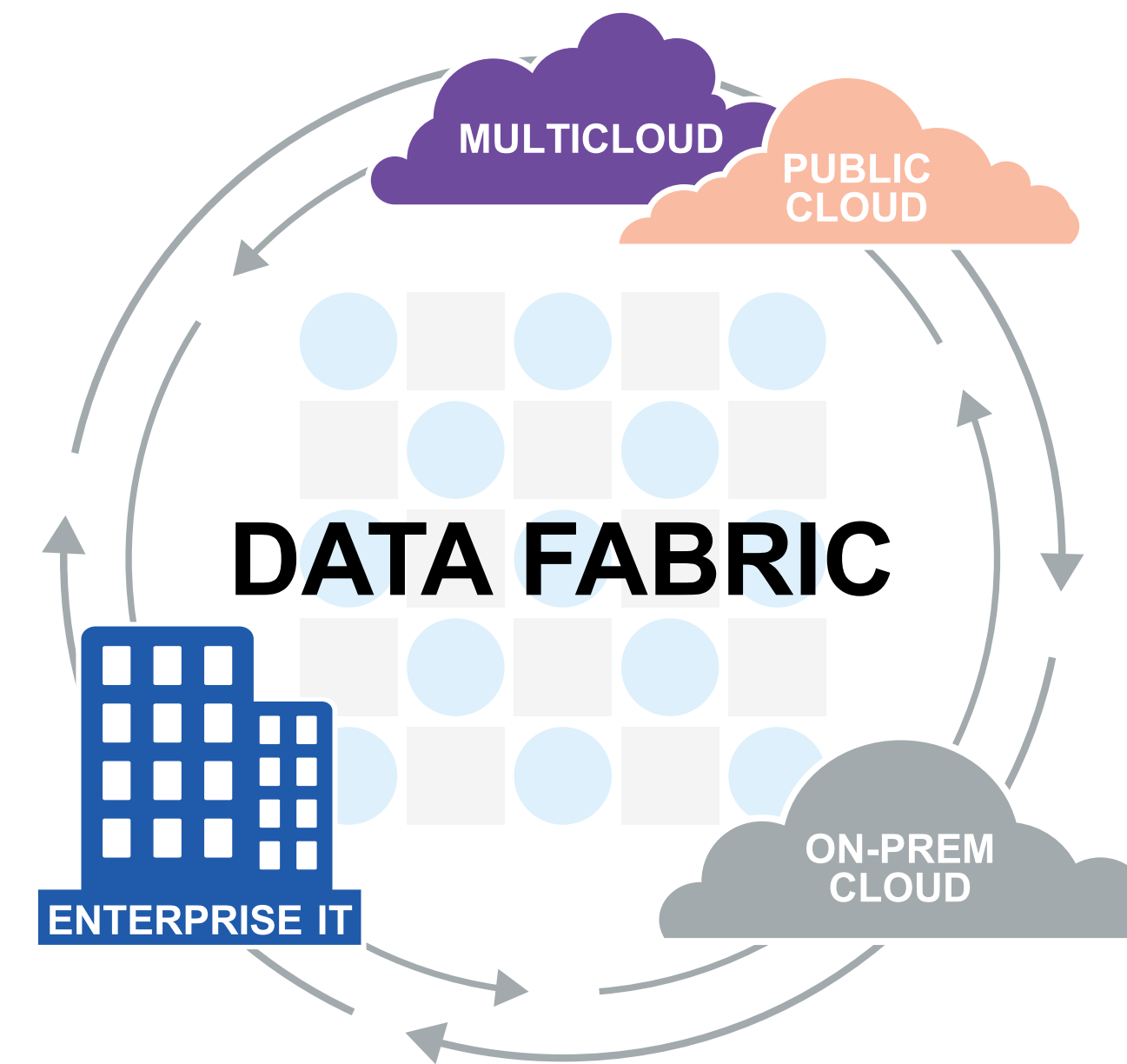
Why a data fabric?
With a data fabric, you can accelerate the missions that are vital to your business, and:

- **Realize the promise of public cloud.** Drive flexibility, speed, cost savings, and innovation.

- **Deliver a public cloud experience on your premises.** Simplify and automate infrastructure for virtualized workloads and new application development.

- **Fuel enterprise applications.** Accelerate new projects, simplify operations, future-proof IT.

- **Develop and deploy applications faster.** Streamline software development and DevOps deployment pipelines.

Modernize your SQL Server environment

Whether you choose to deploy your new SQL Server environment on your premises or in the cloud, NetApp has the solutions to help you transition faster and more easily. Our solutions deliver the resilience, intelligent operations, and cloud flexibility your business requires to get the most value and insight from your SQL Server data.

Powered by NetApp® ONTAP® data management software, NetApp solutions deliver the industry's highest performance, superior flexibility, best-in-class data services, and native integration with the world's leading clouds—Microsoft, Google, and AWS. NetApp's broad portfolio of solutions enables you to adopt the cloud at a pace that works for your business. Optimized setup for Microsoft SQL Server means that you start realizing the benefits of your NetApp investment quickly. Those benefits include faster database response time, the ability to back up and restore data in seconds, and instantaneous cloning for dev/test and analytics.

Top reasons to choose NetApp solutions for SQL Server
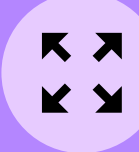
01 **Faster development**
Provision on-premises systems in minutes and cloud volumes in just 8 seconds.

02 **Faster application response times**
Deliver up to 1 million IOPS, submillisecond latency, and 99.9999% availability—on your premises and in the cloud.

03 **Seamless scalability**
Seamlessly scale up and out, and burst to the cloud when necessary.

04 **Protection across Edge, Core, and Cloud**
Enable faster, more complete backups that use less bandwidth and consume less storage space with integrated, automated data protection.

05 **Faster data recovery**
If an outage does occur, NetApp solutions deliver up to 98% faster data recovery.

06 **Reduced costs**
Reduce costs and management complexity with the lowest $/MBps for all-flash arrays in the SPC-2 top 10 list and up to 90% savings in administration time and effort.

Next steps

In the modern data center, IT is charged with achieving maximum performance for business-critical workloads like SQL Server, scaling without disruption as the business grows, and enabling the business to take on new data-driven initiatives. As Microsoft SQL Server 2008 edges toward end of support, thousands of organizations are questioning whether to migrate to the cloud now or remain on the premises with the ability to move to the cloud in the future. By building a hybrid cloud infrastructure with NetApp solutions, you can create a data fabric that enables you to meet business demands and gain a competitive edge now and in the future.

Whether you are deploying your solution in the data center or in the cloud, NetApp solutions deliver the resilience, intelligent operations, and cloud flexibility your business requires to get the most value and insight from your SQL Server data.

Learn more

- NetApp cloud-connected all-flash storage
- Cloud Volumes for SQL Server
- Gain Data Intelligence for SQL Databases: Azure
- Gain Data Intelligence for SQL Databases: AWS
- Gain Data Intelligence for SQL Databases: Google Cloud
- Determining What Enterprise Apps Go Cloud as Part of Building a Cloud Aware Enterprise
- How All-Flash Storage Transforms Enterprise Applications