April 2025

MongoDB Atlas on Microsoft Azure

Modernize, secure your data, and build AI-powered applications

MongoDB. Microsoft

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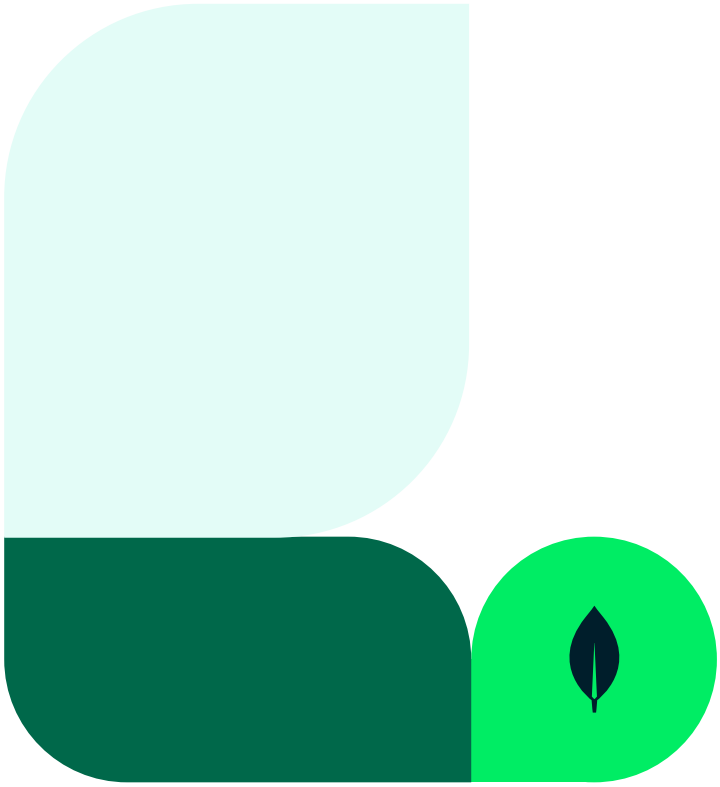


Building AI-Powered Applications With MongoDB and Microsoft

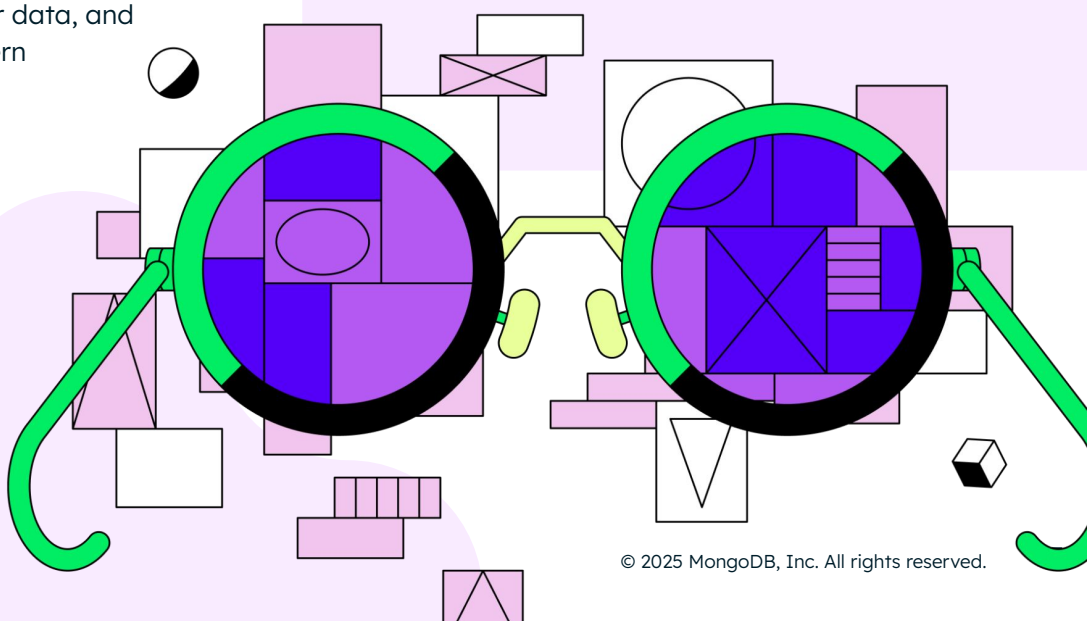
Modern applications—and the businesses that depend on them—rely on analytics, machine learning, and now generative AI to meet the demands of today's customers and employees. But these technologies all share a critical need: fast, secure, and seamless access to diverse data.

To power analytics and AI, you need a database that's flexible enough to unify a variety of enterprise data types—like vector embeddings, operational data, and metadata—all in one place. The database also must be globally distributed, secure, and effortlessly scalable to support users wherever they are.

And once your data is unified and secure, these applications require seamless access to a suite of tools to transform that data into insights and actions.

This e-book details how MongoDB Atlas on Microsoft Azure solves these challenges, offering a powerful ecosystem to help businesses modernize and move to the cloud, unify and secure their data, and use that data to build modern intelligent apps.

> "By integrating MongoDB Atlas with Microsoft Azure's powerful AI and data analytics tools, we empower our customers to build modern AI applications with unparalleled flexibility and efficiency. This collaboration ensures seamless data synchronization, real-time analytics, and robust application development across multi-cloud and hybrid environments."
>
> **- Sandy Gupta, VP, Partner Development ISV, Microsoft.**



MongoDB Atlas on Microsoft Azure

MongoDB Atlas is deeply integrated with the Microsoft Intelligent Data Platform.

That means MongoDB Atlas on Microsoft Azure empowers businesses to focus on driving value instead of managing infrastructure.

How? To answer that question, it's good to start with a basic understanding of MongoDB Atlas.

What is MongoDB Atlas?

MongoDB is the world's leading, modern document database. MongoDB's document model streamlines the process of building applications with a developer-friendly query language and a flexible data model that is easy to work with and easy to scale.

Modern applications need to work with data in many different ways, but too often, organizations add single-purpose data technology to the stack for each new requirement. MongoDB Atlas helps you build and run modern applications by providing a unified way to work with data that addresses transactional workloads, app-driven analytics, full-text search, AI-enhanced experiences, stream data processing, and more.

MongoDB Atlas also allows you to run anywhere

—on your laptop, in your data center, across clouds, or in hybrid environments—to easily meet low-latency performance and data sovereignty or compliance requirements.

Security and data protection are at the core of MongoDB Atlas. HIPAA, GDPR, ISO 27001, PCI, and DSS compliance, coupled with industry-first capabilities such as end-to-end Queryable Encryption, ensure the safe handling of sensitive data.

MongoDB's database platform has been downloaded hundreds of millions of times since 2007, and there are millions of developers trained through MongoDB University courses.

MongoDB Atlas is the leading document database on Microsoft Azure. It is available in 40+ regions to support global deployments.

LEARN MORE

The Right Database for AI and Agentic Systems

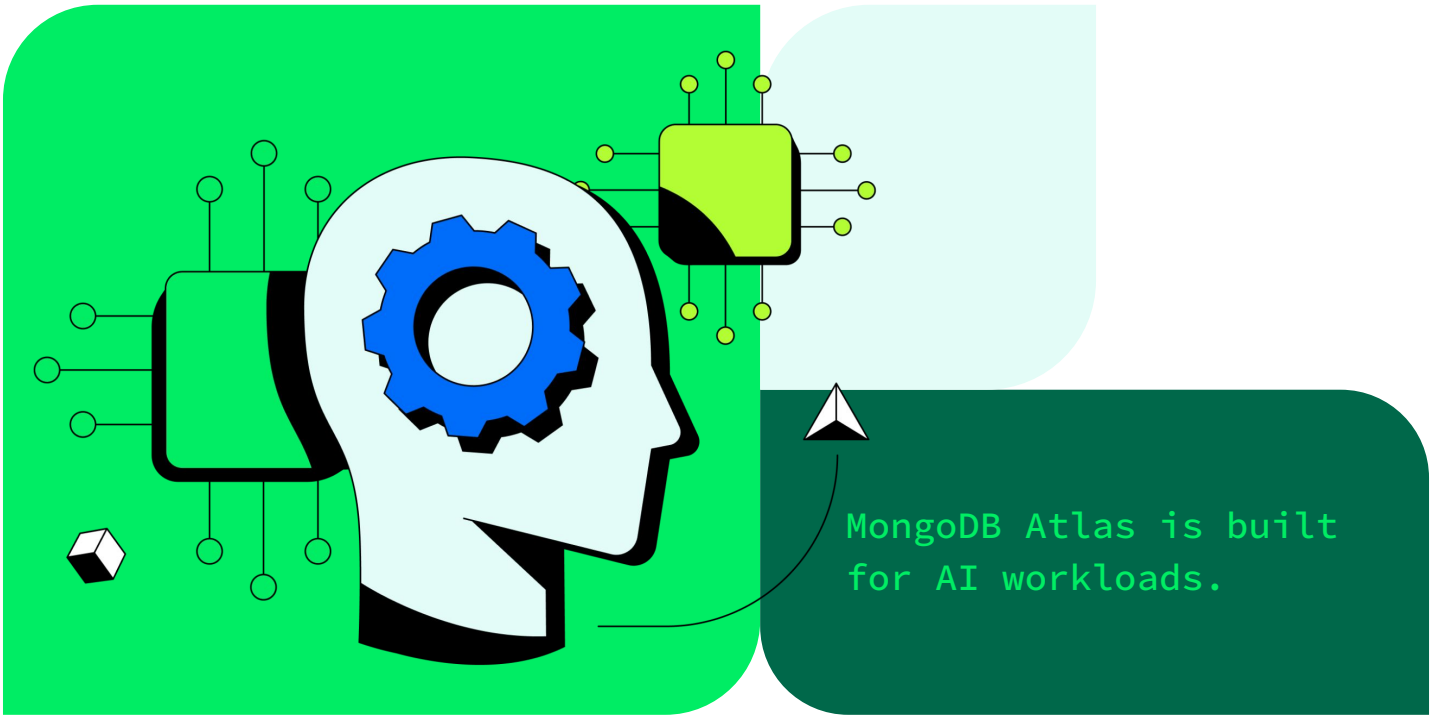
Choosing the right database is crucial for building AI solutions today and preparing for the agentic systems of tomorrow. Unlike traditional machine learning, which relies on passive automation, AI agents are designed for self-directed decision-making—learning from interactions, adapting in real time, and continuously refining their responses as new data emerges.

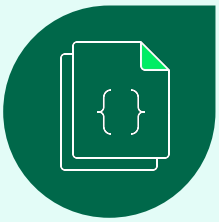
To achieve this level of autonomy, agentic systems need a database that serves as their memory, knowledge base, and operational hub. This database must seamlessly handle diverse and ever-evolving data types, deliver advanced search capabilities, scale automatically, optimize costs for large data volumes, and provide ultra-low-latency access to critical information.

MongoDB Atlas is built for AI workloads. Its flexible schema effortlessly stores any kind of data, including vector embeddings for images, video, audio, and text—right alongside operational business data.

Designed from the ground up for scalability and versatility,

MongoDB's document model and distributed architecture provide the perfect foundation for the AI-driven applications of today and the agentic systems of the future.



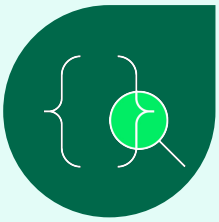


An Adaptable Data Model

MongoDB's document model supports dynamic, evolving data structures, making it ideal for storing vector embeddings alongside operational data—without the rigid constraints of relational models.

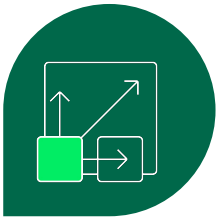
Speaking the language of AI and Agents

Agentic systems are dynamic, encompassing diverse, JSON-structured data types such as interaction logs, state information, orchestration tasks, and behavioral insights. Relational databases are not built to store data in this format. As a result, relational databases often have to convert, translate, and reconvert JSON data to make it consumable by your applications. MongoDB's document model is ideal for storing, transferring, and managing JSON data, without the need for additional ETL, simplifying and accelerating how you build AI-powered applications with data.



Sophisticated Search, Unrivalled Accuracy

For an agent to be truly intelligent, it needs to access the right data at the right time. MongoDB Atlas has built-in full-text and vector search capabilities, allowing for hybrid searches that combine multiple search techniques to ensure agentic systems can retrieve the most relevant data efficiently. One of the architectural strengths of Atlas Search is its integration within MongoDB Atlas. This unification means developers don't need to manage separate search and database infrastructures, which simplifies deployment, reduces latency, and maintains data consistency across operations. It's an efficient approach for AI systems where data consistency and speed are key.



Performance and Scale

Agentic systems, and AI systems in general, can experience huge demands on key components, such as vector search, to drive their advanced decision-making and automation capabilities. Agentic systems also accumulate data over time, much of which may not need constant, high-speed access. With dedicated search and vector Search Nodes, built-in horizontal scaling, Online Archive, and quantization, MongoDB Atlas is uniquely designed to handle the demands of these systems.

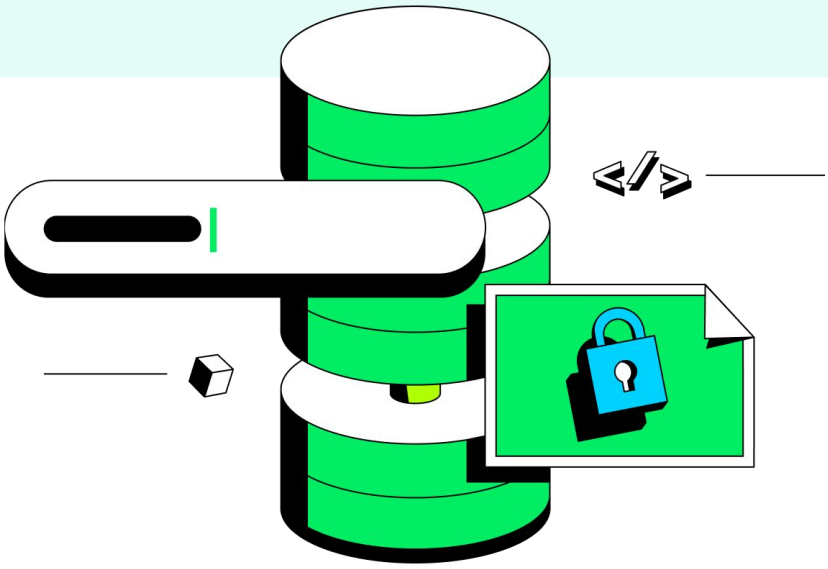
- **Dedicated Resources:** Search Nodes have their own CPU and memory, ensuring optimal performance for even the most demanding search workloads. Search Nodes prevent resource contention, keeping your system responsive even under heavy load.
- **Built-in quantization:** Reduce vector storage and speed up searches, ensuring performance at scale without excessive compute costs.
- **Simplified Management:** Easily handle the complexities of managing search infrastructure so you can focus on building your agentic system.
- **Built-in data tiering:** MongoDB Atlas allows you to lower storage costs with Online Archive; automatically archive older data to more economical cloud storage, significantly reducing expenses while maintaining data integrity.

dedicated search and vector Search Nodes, built-in horizontal scaling, Online Archive, and quantization

Security

MongoDB Atlas includes robust security features essential for agentic systems, ensuring data is always protected and accessible only to authorized users. With advanced authentication, role-based access control, and encryption at rest and in transit, along with queryable encryption, MongoDB safeguards sensitive information from unauthorized access while allowing encrypted data to be queried. Additionally, its auditing capabilities enable comprehensive tracking of database activities, helping to maintain compliance and traceability. MongoDB empowers organizations to build secure, resilient agentic systems that scale with confidence.

- **Fine-grained access control:** MongoDB supports RBAC, which allows you to define roles and assign them to users, granting them specific permissions on collections and databases.
- **Encryption (at rest, in transit, queryable):** With Client-Side Field-Level Encryption (CSFLE) sensitive data is encrypted, remains encrypted throughout its lifecycle, and is only decrypted on the client side. Queryable Encryption is a first-of-its-kind in-use encryption technology that ensures strong cryptographic protection for sensitive information without sacrificing the ability to perform expressive queries on it.
- **Compliance (ISO, HIPPA, GDPR) MongoDB:** Atlas has ISO/IEC 27001 and 9001, PCI DSS, HIPAA, GDPR, FedRAMP, and several other certifications.
- **Observability:** Designed specifically for MongoDB environments, our observability suite provides continuous feedback to improve performance, productivity, and availability.



MongoDB Atlas is Deeply Integrated With Microsoft Data and AI Services

MongoDB Atlas, Microsoft Fabric, and Azure AI Foundry operate as an integrated ecosystem, driving actionable analytical intelligence on historical data and real-time intelligence to power machine learning, generative AI, and agentic use cases.

Build intelligent applications with your data

Tap into the power of generative AI with **Azure OpenAI Service** Build and deploy AI solutions faster with **Azure AI Foundry**

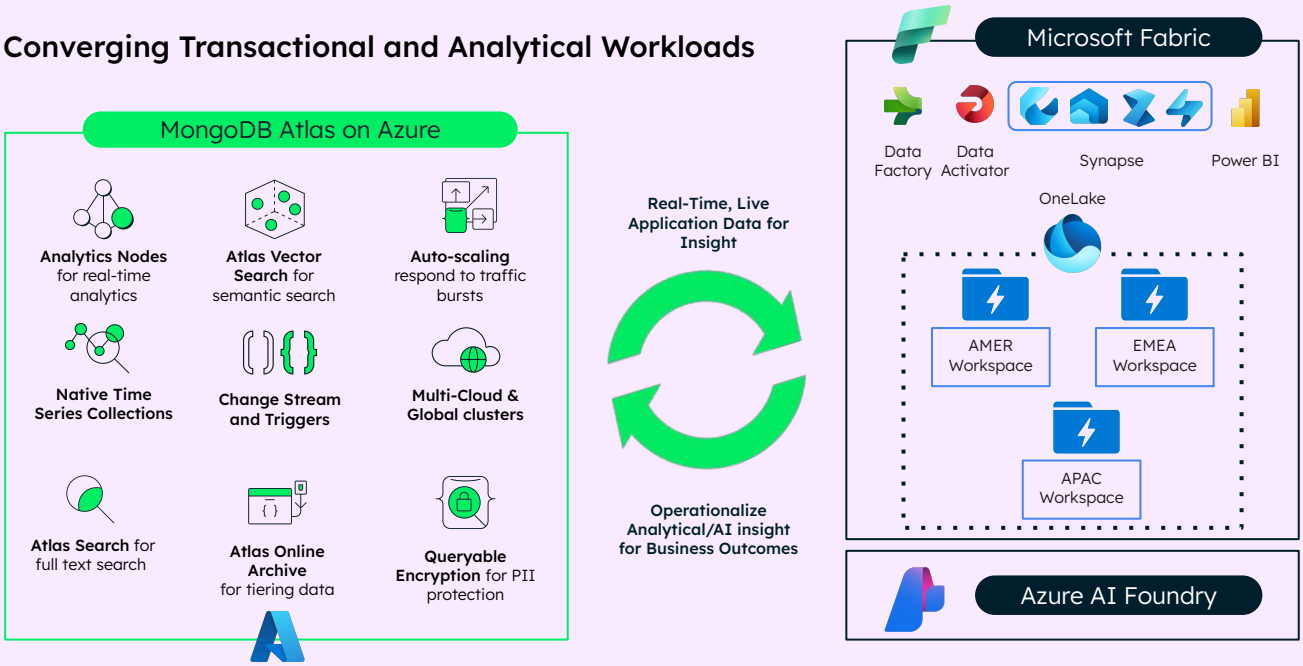
Get real-time insights from all your data in one platform

Extract rich, tailored insights from all your data in near real-time with **Microsoft Fabric** and **Azure Databricks**

Keep your data secure by default

Enhance data security, compliance, and management through integrations with **Microsoft Purview, Azure Entra ID,** and **Azure Key Vault**

Converging Transactional and Analytical Workloads



Build With Your Data

Azure AI

MongoDB Atlas on Azure offers customers full vector database capabilities and the power of Atlas Vector Search combined with Azure AI services to build intelligent, AI-powered applications.

Azure AI Foundry

Get started on a unified AI development platform and start evaluating models and deploying generative AI solutions. Quickly and securely connect MongoDB Atlas as a vector database to build AI applications leveraging Retrieval Augmented Generation (RAG) and other agentic techniques.

Two paths to Azure AI Foundry
A direct connection between data stored in MongoDB Atlas and Azure AI Studio can be established in two ways:

1. Bring pre-vectorized and indexed data stored in MongoDB Atlas on Azure. Azure AI studio will use this data as “memory” for your RAG workflows.
2. “Click to add” MongoDB Atlas as a vector database and let Azure AI Studio handle the chunking, vectorization, storage, and retrieval of vector data for RAG.

GET STARTED

Azure OpenAI Service

With Azure OpenAI Service you can build your own copilot and generative AI applications. An integration of MongoDB Atlas Vector Search with Semantic Kernel (an open-source SDK) enables developers to build AI-powered, intelligent applications leveraging large language models from various providers, including Azure OpenAI Service.

Enable intelligent, real-time insights and advanced AI-driven applications

1. Combine your vectorized MongoDB Atlas data with Azure OpenAI Service to bring the power of LLMs (large language models) to your data to build generative AI experiences using RAG (retrieval-augmented generation).
2. Native integration of MongoDB Atlas Vector Search with Semantic Kernel, a lightweight, open- source development kit, lets you easily build AI agents and integrate the latest AI models into your codebase (Semantic Kernel supports C#, Python, and Java, while LangChain supports Python and JavaScript).

GET STARTED

Analytics

MongoDB Atlas on Azure helps you get the most from your data through integrations with Azure Databricks and Microsoft Fabric, with support for seamless data processing, advanced analytics, and built-in security and AI capabilities.

Microsoft Fabric

Microsoft Fabric can reshape how your teams work with data by bringing everyone together on a single, complete analytics platform built for the era of AI. Whether it's data warehousing, long-running Spark analytics, AI/ML workloads, or real-time analytics, MongoDB Atlas connects your data to Microsoft Fabric's suite of services, empowering businesses to manage data, analytics, and insights efficiently.

There are two paths to Microsoft Fabric. The first is through batch connections, and the second enables near real-time connection between MongoDB Atlas and Microsoft Fabric.

1. **Data pipeline connector:** Source and sink bi-directional flow of data to OneLake.

   Dataflow Gen 2 connector: Specifically for Power BI workloads. Pre-process data ready for ingestion by Power BI.

   Notebooks, via Spark connector: Source and sink bi-directional flow of data to OneLake.

2. **Fabric Open Mirroring:** Real-time intelligence on the current and up-to-date data in MongoDB Atlas

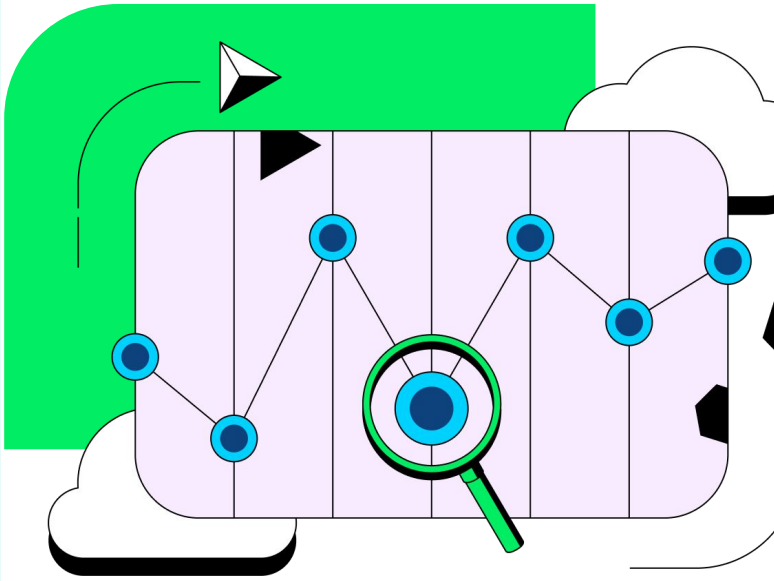
   Open Mirroring in Fabric provides a unique way to bring in data from operational data stores into the uniform data layer of OneLake in Fabric. Once mirroring is enabled for a MongoDB Atlas collection, the corresponding table in OneLake is kept in sync with the changes in source MongoDB Atlas collection, unlocking opportunities of varied analytics and AI and BI in near real-time.

Azure Databricks

With MongoDB Atlas and Azure Databricks, businesses can store and retrieve data for Databricks analytics and processing workloads.

Connect to Azure Databricks

Databricks seamlessly integrates with MongoDB Atlas using the MongoDB Spark Connector, allowing you to read and write data between Databricks and MongoDB collections. Leverage the scalability and flexibility of MongoDB Atlas as the underlying database while performing advanced analytics, data exploration, and machine learning tasks using Azure Databricks. Build and refine models based on the freshest data, operationalize analytical insights and models back into application behavior, and pursue new revenue opportunities across industries.

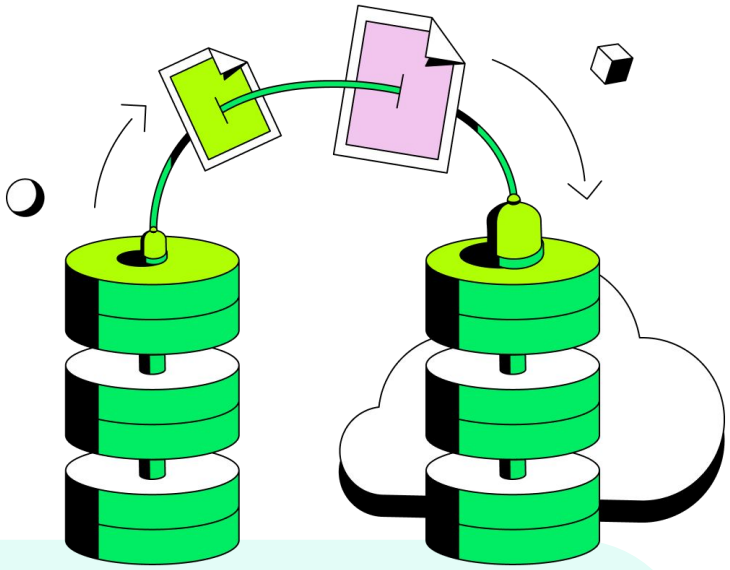


Migrate and Modernize

Migration and modernization in the enterprise are complex, high-stakes undertakings that demand careful planning and execution to mitigate risks.

The benefits of moving to the cloud with MongoDB Atlas on Azure are clear: simplified database management, optimized performance and scalability, automated industry-leading security, and reduced operational complexity, all of which unlock cost savings and help you derive greater value from your data.

MongoDB and Microsoft have joined forces to de-risk this process, offering innovative solutions that streamline the transition.



Migration

Migrating MongoDB workloads from on-premises solutions (MongoDB Enterprise Advanced or Community Edition) or other cloud platforms to MongoDB Atlas on Azure has never been simpler, thanks to Microsoft's Cloud Migration Factory (CMF) and MongoDB Migration Factory.

With Microsoft CMF, eligible customers enjoy a free, hands-on delivery process, offering end-to-end guidance and providing a clear roadmap for every stage of the migration process, from initial validation to post-migration testing, mitigating technical risk, accelerating deployments, and delivering optimized architectures to maximize the benefits of the Azure platform.

Microsoft CMF is also partnered with MongoDB Migration Factory, a structured program that streamlines database migrations to MongoDB using proven tools, best practices, and expert guidance.

Microsoft CMF and MongoDB Migration Factory jointly deliver migrations of MongoDB Enterprise Advanced or Community Edition deployments to MongoDB Atlas on Azure in a secure, optimized, and customer-focused way. By addressing unique aspects of migration, both services provide valuable resources to minimize risk and accelerate modernization efforts.

Migrate Faster with our Microsoft and MongoDB Migration Guide

Modernization

The relational database has been the foundation of enterprise data management for 40 years. Relational databases, however, were never designed to handle the volume, variety, or velocity of data today's applications demand. This can inhibit business agility, limit scalability, and strain budgets, compelling more and more organizations to migrate to alternatives.

Modernizing with MongoDB Atlas on Azure allows enterprises to build apps 3x-5x faster,

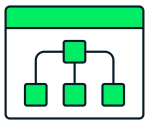
going further than simply lifting and shifting existing applications and data to the cloud. MongoDB Atlas' migration tooling and partner ecosystem can accelerate this digital transformation, employing generative AI to free up developer time, cut costs, and bring innovative solutions to market faster.

MongoDB Relational Migrator

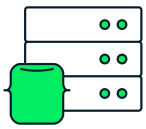
MongoDB Relational Migrator simplifies and accelerates migration from legacy, relational databases to MongoDB Atlas with intelligent schema and code recommendations. A key challenge in migrating legacy applications is converting undocumented SQL queries and stored procedures to MongoDB Query API syntax.

With new AI-powered capabilities, MongoDB Relational Migrator automatically handles these conversions, enabling developers to modernize applications faster without needing prior knowledge of MongoDB syntax. Streamline migrations, eliminate manual tasks, and accelerate development with MongoDB Relational Migrator.

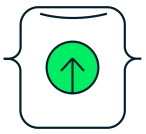
Connect to a relational database to analyze its schema.



Design and map to a MongoDB schema.



Migrate from Oracle, SQL Server, MySQL, and PostgreSQL



Perform snapshot or continuous data migration to MongoDB.

MIGRATE FASTER

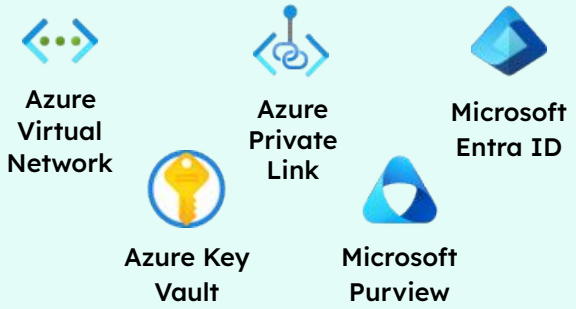
Secure your data

MongoDB Atlas on Microsoft Azure is highly available and secure, with built-in and preconfigured security features across your deployment. It is compliant with HIPAA, GDPR, ISO 27001, PCI DSS, and more.

MongoDB Atlas leads the way in enterprise data security, offering enterprises groundbreaking features such as Queryable Encryption, an industry-first innovation developed by the MongoDB Cryptography Research Group that allows customers to encrypt sensitive application data, store it securely in an encrypted state in the MongoDB database, and perform equality and range queries directly on the encrypted data—all with no cryptography expertise required.

MongoDB Atlas is also integrated with Microsoft Entra ID, Azure Key Vault, Microsoft Purview, and more for enhanced data security, compliance, and management.

With security built into the entire MongoDB Atlas on Microsoft Azure platform, you're ready to deploy and run globally, with confidence, wherever your users are.



Integrate MongoDB Atlas–SSO with Microsoft Entra ID to control access, enable automatic sign-ins, assign roles based on group memberships, and manage accounts centrally in the Azure portal.
Secure your data at rest by managing encryption keys for MongoDB Atlas with Azure Key Vault.
Govern, protect, and manage your data estate with Microsoft Purview, a unified data governance solution that helps you maximize the value of your data.
Enhance network security and privacy by using Azure Virtual Networks and Azure Private Link together, ensuring that traffic between your virtual network and Azure services travels exclusively over the Microsoft backbone network, avoiding exposure to the public internet.

All MongoDB Atlas on Microsoft Azure clusters are highly available by default, and production-level clusters are backed by an **industry-leading uptime SLA of 99.995%**.

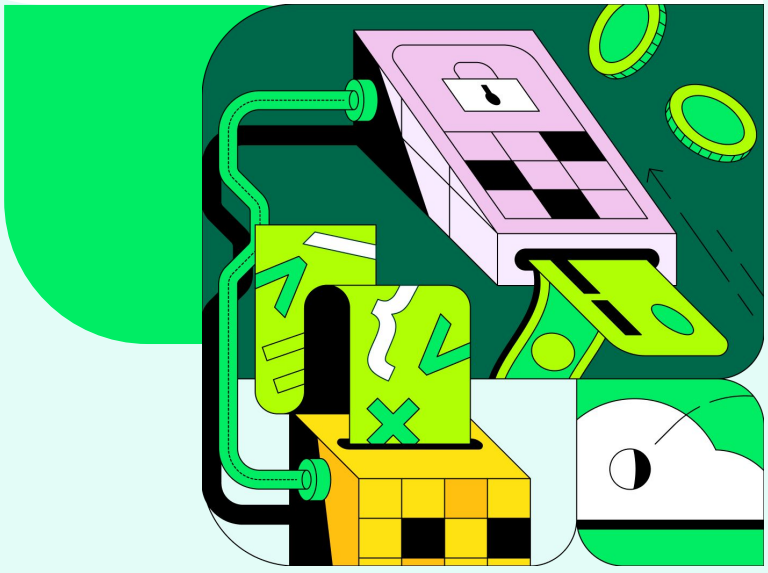
Backup is built in and takes advantage of incremental snapshots in Microsoft Azure for cost savings. Backup and retention policies are easily configurable to satisfy your recovery point objective (RPO), with an RPO as low as one minute. Cloud backup is continuous enabling point-in-time restores, with options for minimizing recovery time objective (RTO).

Customer spotlight

temenos

A recent integration with MongoDB enabled banking software company **Temenos to drive unprecedented transaction volume**. Now the company's customers can experience the future of banking with Temenos Banking Cloud, powered by the dynamic collaboration of MongoDB Atlas and Microsoft Azure through the convenient (Pay-as-you-go) marketplace. This revolutionary solution is reshaping the banking landscape, empowering financial institutions to embrace true innovation, scale their operations effortlessly, and deliver exceptional Customer Experiences.

With the robust capabilities of MongoDB Atlas and the unparalleled infrastructure of Microsoft Azure, Temenos Banking Cloud offers a secure, scalable, and flexible platform that paves the way for unprecedented growth and success in the digital era. Embedded finance loans and 100 million retail accounts showcase its ability to handle massive transaction volumes and support banking growth strategies. Some of the capabilities and transformations the company has embarked on include:



- **Transaction speed:** Achieving a record-breaking rate of 150,000 transactions per second, Temenos enables banks to deliver fast and responsive banking services, ensuring a seamless user experience for customers.
- **Composed solution:** The benchmark test incorporated a composed solution that combined components like payments, financial crime mitigation, data hub, and digital channels. This comprehensive approach optimizes performance across various areas of banking operations.
- **Componentized architecture:** Temenos' componentized architecture allows banks to upgrade their systems without disrupting existing customer requirements. Components can be introduced without compromising uninterrupted service delivery.
- **Cloud-native infrastructure:** Temenos embraces a cloud-first approach, leveraging Microsoft Azure and MongoDB Atlas. This cloud-native infrastructure offers flexibility, scalability, and reliability, enabling optimal performance and availability.
- **JSON and document model:** By implementing a new data backend based on JSON and the document model with MongoDB, Temenos provides transparent data access and unlocks advanced features like Atlas Search, application-driven analytics, and AI. This enhances performance and enables banks to gain valuable data insights.

The key performance improvements achieved by Temenos Banking Cloud empower financial institutions to deliver superior services, drive innovation, and meet the evolving needs of their customers in the dynamic banking industry. With enhanced scalability, lightning-fast transaction speed, comprehensive composed solutions, seamless upgradeability, cloud-native infrastructure benefits, and advanced data handling capabilities, Temenos revolutionizes banking by enabling true transformation and delivering exceptional experiences.

Customer spotlight

With **greater reach and growth,** and through close partnership with MongoDB, Mural empowers digital collaboration at scale in the (pay-as-you-go) Microsoft commercial marketplace.

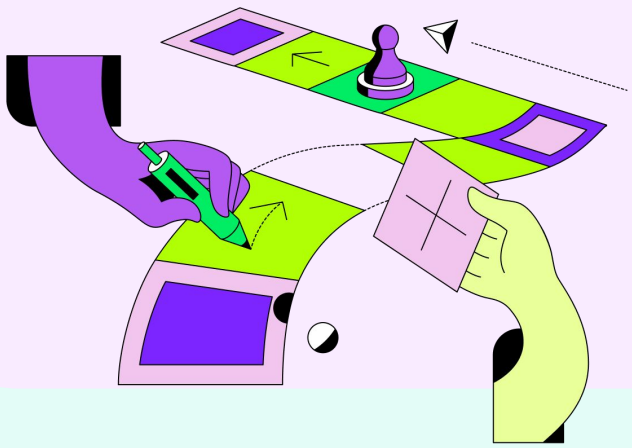
Mural and MongoDB, both Microsoft partners and customers, are working together with Microsoft to inspire innovation and change how their customers collaborate to work better, easier, and faster. Mural uses MongoDB Atlas and its integrated suite of cloud database and data services to accelerate and simplify how it builds collaborative solutions with data.

Moving to MongoDB Atlas

Along with the increased demand, Mural needed to find a new solution that could support its data usage needs while being scalable, reliable, and adaptable. Mural turned to MongoDB Atlas on Microsoft Azure in 2019 because of the unstructured nature of its application software and multi-tenant databases.

The working partnership between Mural and MongoDB has also been very collaborative. MongoDB has worked closely with the Mural team to iterate on unique customer offerings where specific and advanced encryption is required. They've also collaborated on data residency requirements, database partitioning, and working with architects and core services teams to provide strategy around database performance.

> Working with MongoDB Atlas has enabled us to build faster customer outcomes, ship faster, and ultimately provide more expeditious value to our customers
>
> — Guido Vilariño,
> Vice President of DevOps for Mural.



> We have a relatively small infrastructure team here. In the past two years of massive growth, we've been able to keep up with the demand without having to add headcount. This really has helped our small teams focus on refining and discovery, ultimately leading to better experiences for our customers
>
> — Rebecca Campbell
> Vice President of Engineering at Mural

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