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We are pursuing one of the largest & fastest growing markets in software
But our market is different than other software markets; it is not monolithic.
The unit of competition in many other software markets is a **customer**.

Competition tends to be binary - only one competitor wins a customer.
The unit of competition in our market is a **workload**.

To gain share inside an account, we need to win more workloads over time.
An Illustrative Atlas Customer Journey

Every customer journey begins with the first workload.
An Illustrative Atlas Customer Journey

Once we onboard a workload, its growth is a function of multiple application-specific factors and macro conditions.
What we focus on is adding new workloads and making them more successful over time.
There will be an explosion in the number of workloads over the next few years

Accelerated Innovation
More applications will be built in the next 5 years than in the last 40 years combined
- Microsoft

Developer Power
Developers are now the real decision makers in technology.
- Stephen O’Grady, Redmonk

New Developer Tech
By 2024, 80% of tech products and services will be built by those who are not technology professionals
- Gartner
Our entire company is oriented around winning more workloads.
Winning More Workloads

- **Make it easier to migrate to MongoDB**
  - App Modernization

- **Address even more workload types**
  - Search
  - App-Driven Analytics
  - Time Series
  - Queryable Encryption
  - Vector Search

- **Support new application architectures**
  - Streams
  - Serverless
  - Edge
  - Hybrid
Before we get into new announcements, let’s not forget the essentials.

MongoDB’s foundational technical advantage is the document model.
The three fundamental truths about the document model

Document model allows developers to build and modify applications faster.

A well-written app using MongoDB uses 50-70% less I/O and CPU; i.e. it is cheaper to run.

Apps built using MongoDB are more performant and scalable.
Our principal competitor remains legacy relational technology
We see our customers struggle to innovate with relational databases because:

- They are optimized for constraints developers no longer have
- The data structures clash with modern data and objects developers work with
- Rigidity makes experimenting and iterating on applications difficult
Most customers apply “Band-Aids” around the relational database to build modern experiences:

- Niche Data Stores to plug gaps in RDBMS
- Search engines to serve up relevant info
- Mobile and edge databases to manage data on-device and sync to the backend
- Analytics systems for reporting and ML
Why these Band-Aid solutions?

Because getting off relational is hard.
Getting off Relational is Hard

Update schema

Determine how the existing relational schema should be best represented in MongoDB document model.

Rewrite code

Update or rewrite application code to support new user requirements, modern tech stack and updated schema.

Migrate data

Perform one-time or continuous replication of data, allowing cutover from the legacy to the modernized app.
App modernization requires a holistic approach

Technology
Products and integrations to make data migration and app modernization activities as simple as possible

People
Organizations need to break relational mindset by training, inspiring and empowering their developers to build with modern technologies

Partnerships
Ecosystem of experts with deep modernization experience to drive outcomes at every step of customers’ modernization journeys
General Availability of Relational Migrator

**Design** an effective MongoDB schema, derived from an existing relational schema.

**Migrate** data from Oracle, SQL Server, MySQL, PostgreSQL, and Sybase ASE to MongoDB, while transforming to the target schema.

**Generate** code artifacts to reduce the time required to update application code.
Supported databases and scenarios

**Sources** (Cloud or on-premises)
- Oracle
- SQL Server
- MySQL
- PostgreSQL
- Amazon RDS
- Sybase
- Microsoft Azure SQL Server Database
- Amazon Aurora

**Destinations** (Cloud or on-premises)
- MongoDB Atlas
- MongoDB Enterprise Advanced

**Scenarios**
- Snapshot
  - For simple migrations with downtime
- Continuous/CDC
  - For no-downtime migrations by replaying updates during sync
Customer Stories

“Migrating an entire database is a pretty bold and risky endeavour. Amazingly, we didn’t experience any disruption or downtime.”

Francesco Pagetti,
Solutions Architect at Powerledger

“Recently, I had the chance to employ MongoDB’s Relational Migrator, and I was genuinely amazed by its outstanding performance. The user interface of the tool is intuitively designed, and the entity relationship diagrams proved to be invaluable in offering a detailed visual representation of my data structures.”

Peter Madeley,
Software Engineer at Nationwide Building Society
People: Training and empowering developers

Professional Services
Comprehensive training + consulting engagements for migration initiatives.
PS team teaches best practices and establishes Center of Excellence as they execute their migration plan.

MongoDB University
Dedicated course - M100: MongoDB for SQL Pros
Currently developing a SQL Professionals Learning Path that includes additional courses, like a Learning Byte for Relational Migrator

Developer Relations
Design review days for large customers doing wide-spread MongoDB adoptions.
DevRel team assists with designing/reviewing a data model hand-in-hand with development team.
Partners: Building an ecosystem to support modernization

Global Systems Integrators

- accenture
- TCS
- Infosys
- Capgemini

Jumpstart Partners

- PeerIslands
- gravity9
- EXAFLUENCE
- Clarity
- WeKan
- pureinsights
We will continue investing to drive app modernization.

We’ll tell you more in the AI section.
Winning More Workloads

- Make it easier to migrate to MongoDB
- Address even more workload types
  - Search
    - App-Driven Analytics
    - Time series
    - Queryable Encryption
    - Vector Search
- Support new application architectures
  - Streams
  - Serverless
  - Edge
  - Hybrid

App Modernization
Search is ubiquitous in application experiences

Conditioned by decades of using internet search engines, users expect all the applications they rely on at home and at work to provide the same feature-rich and intuitive search experience. This translates into three primary categories of business requirements with many common underlying required capabilities:

- Human-friendly UX, Ease of Navigation, Fast and Relevant Results
- Catalog & Content Search
  - Built for discovering and consuming info
- Application Search
  - General purpose navigation within a regular business app
- Single View & Customer 360
  - Reconciling ingested records to build Customer 360 views
How Search is usually built without Atlas Search

**Lower developer productivity**
Developers need to use different query APIs for database and search and coordinate schema changes.

**Architectural complexity**
Difficult to keep data in sync between two separate systems. Requires its own systems and skills.

**Operational overhead**
More to provision, secure, upgrade, patch, back up, monitor, scale, etc.
With Atlas Search, you can compress the database, sync, and search engine into one.

Avoid the ‘synchronization tax’
With Atlas Search, data is automatically and dynamically synced from the database to Atlas Search indexes.

Deliver new search features faster
Use a single, unified API across database and search operations.

Work with a fully managed platform
Combine Apache Lucene with the security, performance, and reliability of Atlas.
Our value proposition is resonating with customers

“We switched to Atlas Search because I’m already using the MongoDB database, and everything is in the same place. So it’s a part of my infrastructure that I can eliminate, and I stop having to replicate and reindex data.”

- Hermes Martin, Senior Software Engineer, Mobly

“We’re planning to move all of our search functionality to use Atlas Search. The ability to have a built-in full-text search engine for our data without any additional infrastructure to manage is incredibly valuable.”

- Zac Rosenbauer, VP of Technology, Precognitive

“All of our search is powered by MongoDB’s own Atlas Search. It’s so much easier and more efficient to use functionality that’s fully integrated with the database instead of separate services with their own costs.”

- Ryan O’Connell, CTO, Humanitix
Dedicated Search Nodes in preview

Announcing Today

Scale search workload resources independent of the operational database

Grant customers better observability, control, and cost visibility

Pave the way for mission critical, high performance usage at scale

All while maintaining the seamless integration and intuitive developer experience
Winning More Workloads

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  - App Modernization

- Address even more workload types
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- Support new application architectures
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  - Hybrid
Data encryption is a critical, yet only a partially solved problem.

- **Data in transit** is encrypted using protocols like TLS and HTTPS.
- **Data at rest** is also encrypted, preventing data theft when the database is offline.
- However, **data in use** isn’t encrypted, leaving it vulnerable to insider access and active breaches.
Encrypting data in use has historically posed a challenge - data could EITHER be encrypted OR queryable, but not both.
This is because using expressive queries on encrypted data in use is a highly complex problem that sits at the intersection of advanced cryptography and database engineering.
Queryability vs Encryption

- **Most Databases**: Yes
  - With Queryable Encryption
- **Some Databases**: No
  - With Client-Side Field Level Encryption
General Availability of Queryable Encryption with MongoDB 7.0

Announcing Today

Next generation encryption technology querying on fully randomized encrypted data

Faster app development – no cryptography experience required

End-to-end encryption – Data is encrypted through out data lifecycle
Protect your sensitive workloads while still being able to query the encrypted data

Sensitive data is protected as the data remains encrypted from the client, during transport, at-rest, and while being processed in memory.

Queryable Encryption’s fast encrypted search algorithm allows the server to process queries without ever decrypting the data and is performant on the most common sensitive workloads.

Highly sensitive workloads
- PII/PHI, financial records, medical records, critical infrastructure

Meet data privacy requirements
- HIPAA, GDPR, PCI, CCPA, etc.
Winning More Workloads

Make it easier to migrate to MongoDB

App Modernization

Address even more workload types

Search
App-Driven Analytics
Time series
Queryable Encryption
Vector Search

Support new application architectures

Streams
Serverless
Edge
Hybrid
Streaming data is core to modern apps

Organizations across industries are building new applications that need access to low latency data to deliver compelling experiences to customers and be more competitive in their market.

Event based architectures and streaming data play a critical role in use cases like fraud detection, sensor networks, and real time alerting in a variety of industries from Aerospace, IoT, Manufacturing, Network Security, Fintech and more.
Components of a streaming system

**Streaming Transport**
Services that ingest data from “sources” as it’s created and then stream that data to targets (“sinks”). Kafka is the dominant technology.

**Stream Processing**
Services that perform real-time queries on streaming data, such as transformations and aggregations.

**Databases**
Ingest and index data from streaming platforms and processors into a persistence layer, making it queryable.
Existing stream processing solutions face limitations

Rigid schemas that are difficult to adapt to data in motion create fiction and require additional processing steps.

Introducing a stream processing "point solution" to an application stack increases operational complexity and cost.

Disparate APIs, drivers, and tools create a fragmented development experience.
Announcing Today

Atlas Stream Processing in preview

- Built around the Document model and flexible schemas
- Enables complex, continuous processing of streaming data
- Integrates working with data at rest with data in motion in an elegant developer experience
Atlas Stream Processing brings the flexibility and developer experience that MongoDB is known for to the streaming ecosystem.
How does AI impact MongoDB?

- AI will increase the volume and sophistication of applications being built
- MongoDB will be a preferred platform for AI-powered applications
- Vector Search is a foundational element for GenAI applications
- AI will accelerate application modernization
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New compute paradigms have historically created waves of app creation.
Volume of applications being built

1970s
Mainframes enabling back office apps

1980s
PCs enabling the first gen of consumer apps

1990s
Client-server enabling distributed applications

2000s
The rise of mobile and smartphone/tablet apps

2010s
Cloud enabling SaaS, Web 2.0, etc.

Increasing importance of the developer
AI is the next platform paradigm...

Automation of app development - code generation, testing, debugging, optimization tools

More data-intensive applications - data volumes, real-time availability, distribution

Apps using all classes of data - images, video, audio, geospatial, etc

New user experiences - Natural Language Processing and personalized AR/VR experiences
...driving demand in an already large market

Source: IDC, Data Management Software Market, $Bn
At the most basic level, we see AI as a driver of application volume, which should benefit us over time.
How does AI impact MongoDB?

- AI will increase the volume and sophistication of applications being built.
- MongoDB will be a preferred platform for AI-powered applications.
- Vector Search is a foundational element for GenAI applications.
- AI will accelerate application modernization.
What does an AI-powered app need from its operational data layer?
What do AI-powered apps need?

- Represent the versatility and rich structure of the real world
- Efficiently handle rapidly changing access patterns as applications evolve
- Support the scale and performance of multi-layered machine to machine applications of the future
- Distribute data across clouds and regions for resilience, low latency, and differentiated AI cloud services

What is MongoDB known for?

- Flexibility & Rich Query Language
- Broad Workload Support
- Performance at Scale
- Global and Multicloud
All of our competitive advantages are even more relevant for AI-powered workloads
How does AI impact MongoDB?

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Vectors are a numeric representation of data and related context

Source Data
(text, code, images, video)

Embedding

[0.3, 0.1, 0.2 ... 0.4]
Similar Vectors plotted in space will be near one another
Relate data based on characteristics and meaning
Vector Search

Use Cases

Vector Search unlocks a new way to search related data for AI and Search use cases:

- Indexes text, images, sound, and video
- Augment foundational LLMs with proprietary incremental data & reduce hallucinations
- Question & Answer Systems
- Improved Recommendations & Relevance Scoring
- Dynamic Personalization
- Conversational Support
- Synonym Generation
Illustrative Vector Search App Architecture

Data Sources

Data Pre-Processing

Embedding Creation

Vector Search

Core & Metadata Store

Prompt Engineering

LLMs

Response returned

Apps

User request received, sent through embedding creation pipeline, and used for vector similarity search

Core data retrieved based on vector similarity search

Prompt assembly

Similarity Search Results

Prompt assembly

Traditional Request / Response
Announcing Today

Atlas Vector Search in preview

Vector data is integrated with application data and seamlessly indexed for semantic queries.

Developers work with database and search via the unified MongoDB Query API.

Fully managed for you so you can focus on your application.
Vector Search With MongoDB

User request received, sent through embedding creation pipeline, and used for vector similarity search

Data Sources → Embedding Creation → Core data, metadata, and embeddings stored → Vector Search, Core & Metadata Store → Prompt Engineering → LLMs → Response returned

Prompt assembly

Traditional Request / Response

Similarity Search Results

Apps
We bring to Vector Search the value proposition of our Developer Data Platform - a fully managed, unified, and elegant developer experience.
How does AI impact MongoDB?

- AI will increase the pace, volume, and sophistication of applications being built.
- MongoDB will be a preferred platform for AI-powered applications.
- Vector Search is a foundational element for GenAI applications.
- AI will accelerate application modernization.
Getting off Relational is Hard

Update schema
Determine how the existing relational schema should be best represented in MongoDB document model.

Rewrite code
Update or rewrite application code to support new user requirements, modern tech stack and updated schema.

Migrate data
Perform one-time or continuous replication of data, allowing cutover from the legacy to the modernized app.
Today we announced a big step in making it easier - Relational Migrator

**Design** an effective MongoDB schema, derived from an existing relational schema.

**Migrate** data from Oracle, SQL Server, MySQL, PostgreSQL, and Sybase ASE to MongoDB, while transforming to the target schema.

**Generate** code artifacts to reduce the time required to update application code.
But rewriting application code remains a difficult task, and AI can help.
Rewriting code with AI

**Feature in development**

**SQL query conversion**

Imported stored procedures and embedded SQL queries from connected relational databases.

Relational Migrator uses generative AI to convert these into MongoDB Queries.

Creates MongoDB Query based on the schema that has been designed in Relational Migrator.

**In the future**

**Application code conversion**

**Assessment:** search and understand codebases to understand the effort and risk involved in refactoring an application.

**Code conversion:** suggest application code alongside application architecture recommendations to best take advantage of MongoDB.

**Testing:** verify that converted applications perform as expected on MongoDB.
While app modernization may never be easy, AI promises a new set of tools to make it easier over time.