7 Big Reasons to Upgrade to MongoDB 6.0

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First announced at MongoDB World 2022, MongoDB 6.0 is now generally available and ready for download now. MongoDB 6.0 includes the capabilities introduced with the previous 5.1–5.3 Rapid Releases and debuts new abilities to help you address more use cases, improve operational resilience at scale, and secure and protect your data.

The common theme in MongoDB 6.0 is simplification: Rather than forcing you to turn to external software or third-party tools, these new MongoDB capabilities allow you to develop, iterate, test, and release applications more rapidly. The latest release helps developers avoid data silos, confusing architectures, wasted time on integrating external tech, missed SLAs and other opportunities, and the need for custom work (such as pipelines for exporting data).

Here's what to expect in MongoDB 6.0.

time series data provide a gold mine of insights – from user growth to promising areas of revenue – helping you grow your business and improve your application.

First introduced in MongoDB 5.0, time series collections provide a way to handle these workloads without resorting to adding a niche technology and the resulting complexity. In addition, it was critical to overcome obstacles unique to time series data, such as high volume, storage and cost considerations, and gaps in data continuity (caused by sensor outages).

Since its introduction, time series collections have been continuously updated and improved with a string of rapid releases. We began by introducing sharding for time series collections (5.1) to better distribute data, before rolling out columnar compression (5.2) to improve storage footprints, and finally moving on to densification and gap-filling (5.3) for allowing teams to run time series analytics – even when there are missing data points.

As of 6.0, time series collections now include secondary and compound indexes on measurements, improving read performance and opening up new use cases like geo-indexing. By attaching geographic information to time series data, developers can enrich and broaden analysis to include scenarios involving distance and location. This could take the form of tracking temperature fluctuations in refrigerated delivery vehicles during a hot summer day or monitoring the fuel consumption of cargo vessels on specific routes.

We've also improved query performance and sort operations. For example, MongoDB can now easily return the last data point in a series – rather than scanning the whole collection – for faster reads. You can also use clustered and secondary indexes to efficiently perform sort operations on time and metadata fields.

2. A better way to build event-driven architectures

With the advent of applications like Seamless or Uber, users have come to expect real-time, event-driven experiences, such as activity feeds, notifications,

or recommendation engines. But mov the speed of the real world is not easy, as your application must qui y and act on changes in your data.

Introduced in MongoDB 3.6, change streams provide an API to stream any changes to a MongoDB database, cluster, or collection, without the high overhead that comes from having to poll your entire system. This way, your application can automatically react, generating an in-app message notifying you that your delivery has left the warehouse or creating a pipeline to index new logs as they are generated.

The MongoDB 6.0 release enriches change streams, adding abilities that take change streams to the next level. Now, you can get the before and after state of a document that's changed, enabling you to send updated versions of entire documents downstream, reference deleted documents, and more. Further, change streams now support data definition language (DDL) operations, such as creating or dropping collections and indexes.

To learn more, check out our blog post on change streams updates.

3. Deeper insights from enriched queries

MongoDB's aggregation capabilities allow users to process multiple documents and return computed results. By combining individual operators into aggregation pipelines, you can build complex data processing pipelines to extract the insights you need.

MongoDB 6.0 adds additional capabilities to two key operators, `$lookup` and `$graphlookup`, improving JOINS and graph traversals, respectively. Both `$lookup` and `$graphlookup` now provide full support for sharded deployments.

The performance of `$lookup` has also been upgraded. For instance, if there is an index on the foreign key and a small number of documents have been matched, `$lookup` can get results between 5 and 10 times faster than before. If a larger number of documents are matched, `$lookup` will be twice as fast as previous iterations. If there are no indexes available (and the join is for exploratory or ad hoc queries), then `$lookup` will yield a hundredfold performance improvement.

The introduction of read concern `snapshot` and the optional `atClusterTime` parameter enables your applications to execute complex analytical queries against a globally and transactionally consistent snapshot of your live,

operational data. Even as data change... ...neath you, MongoDB will preserve point-in-time consistency of the qu... ...returned to your users.

These point-in-time analytical queries can span multiple shards with large distributed datasets. By routing these queries to secondaries, you can isolate analytical workloads from transactional queries with both served by the same cluster, avoiding slow, brittle, and expensive ETL to data warehouses. To learn more, visit our documentation.

4. More operators, less work

Boost your productivity with a slate of new operators, which will enable you to push more work to the database – while spending less time writing code or manipulating data manually. These new MongoDB operators will automate key commands and long sequences of code, freeing up more developer time to focus on other tasks.

For instance, you can easily discover important values in your data set with operators like `$maxN` , `$minN` , or `$lastN`. Additionally, you can use an operator like `$sortArray` to sort elements in an array directly in your aggregation pipelines.

5. More resilient operations

From the beginning, MongoDB's replica set design allows users to withstand and overcome outages.

Initial sync is how a replica set member in MongoDB loads a full copy of data from an existing member – critical for catching up nodes that have fallen behind, or when adding new nodes to improve resilience, read scalability, or query latency.

MongoDB 6.0 introduces initial sync via file copy, which is up to four times faster than existing, current methods. This feature is available with MongoDB Enterprise Server.

In addition to the work on initial sync, MongoDB 6.0 introduces major improvements to sharding, the mechanism that enables horizontal scalability. The default chunk size for sharded collections is now 128 MB, meaning fewer chunk migrations and higher efficiency from both a networking perspective and in internal overhead at the query routing layer. A new

`configureCollectionBalancing` command, allows the defragmentation of a collection in order to reduce the impact of the sharding balancer.

6. Additional data security and operational efficiency

MongoDB 6.0 includes new features that eliminate the need to choose between secure data or efficient operations.

Since its GA in 2019, client-side field-level encryption (CSFLE) has helped many organizations manage sensitive information with confidence, especially as they migrate more of their application estate into the public cloud. With MongoDB 6.0, CSFLE will include support for any KMIP-compliant key management provider. As a leading industry standard, KMIP streamlines storage, manipulation, and handling for cryptographic objects like encryption keys, certificates, and more.

MongoDB's support for auditing allows administrators to track system activity for deployments with multiple users, ensuring accountability for actions taken across the database. While it is important that auditors can inspect audit logs to assess activities, the content of an audit log has to be protected from unauthorized parties as it may contain sensitive information.

MongoDB 6.0 allows administrators to compress and encrypt audit events before they are written to disk, leveraging their own KMIP-compliant key management system. Encryption of the logs will protect the events' confidentiality and integrity. If the logs propagate through any central log management systems or SIEM, they stay encrypted.

Additionally, Queryable Encryption is now available in preview. Announced at MongoDB World 2022, this pioneering technology enables you to run expressive queries against encrypted data – only decoding the data when it is made available to the user. This ensures that data remains encrypted throughout its lifecycle, and that rich queries can be run efficiently without having to decrypt the data first. For a deep dive into the inner workings of Queryable Encryption, check out this feature story in *Wired*.

7. A smoother search experience and seamless data sync

Alongside the 6.0 Major Release, MongoDB will also make ancillary features generally available and available in preview.

The first is Atlas Search facets, which enable fast filtering and counting of results, so that users can easily narrow searches and navigate to the data they need. Released in preview at MongoDB World 2022, facets will now include support for sharded collections.

Another important new addition is Cluster-to-Cluster Sync, which enables you to effortlessly migrate data to the cloud, spin up dev, test, or analytics environments, and support compliance requirements and audits.

Cluster-to-Cluster Sync provides continuous, unidirectional data synchronization of two MongoDB clusters across any environment, be it hybrid, Atlas, on-premises, or edge. You'll also be able to control and monitor the synchronization process in real time, starting, stopping, resuming, or even reversing the synchronization as needed.

Ultimately, MongoDB 6.0's new abilities are intended to facilitate development and operations, remove data silos, and eliminate the complexity that accompanies the unnecessary use of separate niche technologies. That means less custom work, troubleshooting, and confusing architectures – and more time brainstorming and building.

> *MongoDB 6.0 is not an automatic upgrade unless you are using Atlas serverless instances. If you are not an Atlas user, download MongoDB 6.0 directly from the download center.*
>
> *If you are already an Atlas user with a dedicated cluster, take advantage of the latest, most advanced version of MongoDB. Here's how to upgrade your clusters to MongoDB 6.0.*

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Change Streams in MongoDB 6.0 Support Pre- and Post-Image Retrieval, DDL operations, and...

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