

# Comparing Firebase vs MongoDB

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Firebase and MongoDB are both working to create the robust, usable, and scalable modern database platforms for application developers. As managed services have swept our industry in the wake of cloud's rise to dominance, developer expectations are rising. Across every industry, a new generation of consumers are demanding highly usable, drastically simplified interfaces, and fully managed, self-service experiences—and developers are no different. It's an exciting time in the history of databases, and indeed software development as a whole, that is unlocking new levels of developer productivity and data utility.

Before we talk about the differences between Firebase and MongoDB, let's start with the similarities between the two systems: both are post-relational databases with similar JSON-like document data models and schemas, and both are built for ease of application development and horizontal scalability. Both Firebase and MongoDB allow developers to get started quickly and iterate on their data structures as they build, and both separate data into “collections” for easy distribution across scalable database clusters.

Firebase includes two data stores: the Real-Time Database and Cloud Firestore, each optimized for a different part of application development.

The Real-Time Database is really more of a publish/subscribe (pubsub) system designed for rapid ingestion and processing of data, while the Cloud Firestore is designed for long-term data storage and retrieval. Cloud Firestore provides a programmatic interface for retrieving data based on “references,” with a SQL-like query syntax designed for asynchronous processing.

## Python example:

```
ref = db.reference('aliens')

snapshot = ref.order_by_child('number_of_eyes').equal_to(3).get()

aliens = [{key: value} for key, value in snapshot.items()]
```

MongoDB is a more robust document database known for high performance and best-in-class security, and has several advantages over Firebase. For example, MongoDB can be operated on-premise or in the cloud (using MongoDB Atlas, or self-managed cloud MongoDB), while Firebase is purely a cloud database service.

The MongoDB Query Language, or MQL, is designed from the ground up for doing advanced queries and updates on the JSON-like document structures at the heart of both of these data stores. MQL uses the same JSON syntax as MongoDB documents and APIs, and allows for extremely powerful and complex queries to be assembled by hand, or programmatically, with ease.

#### Python example:

```
aliens = db['aliens'].find({'number_of_eyes': 3, 'number_of_toes': {'$gt': 10}})
```

Both Firebase and MongoDB are modern post-relational databases that allow for flexibility and speed to market, while Firebase is more popular for smaller applications, and MongoDB moreso for big data and high-performance use cases.

## A note about “NoSQL”

While MongoDB emerged as part of the wave of so-called “NoSQL” databases, MongoDB and Firebase are both more similar to their relational forebearers than most of the more single-purpose NoSQL solutions.

MongoDB, for instance, supports ACID transactions, schema validation, and even cross-collection joins, and is intended to handle similar workloads to those that were traditionally the domain of relational databases like Oracle or MySQL, while bringing the scale-first architecture and structural flexibility that typifies NoSQL solutions.

## Firebase vs MongoDB Atlas

It wouldn't be fair to compare Google's Firebase and MongoDB without talking about [MongoDB Atlas](#), the flagship database as a service from the team at MongoDB. That's because while Firebase is a database, it is also an application development platform designed in particular for mobile app developers that includes hosting, authentication, data-driven triggers, and analytics. MongoDB Atlas brings MongoDB into the fully managed database world with automated operations, hosting, backup, triggers, and much more.

Firebase is explicitly designed for mobile application development, and its entire user interface and onboarding flow are built around that use case. As such, Firebase has more features for mobile applications (like associating one Firebase instance with one mobile app, and monitoring application usage in the same console), while MongoDB Atlas is built for general-purpose data development, and has many more buttons and knobs to tweak performance, integrations with third-party business intelligence tools, and advanced features for large data installations like Atlas Data Lake.

With the acquisition of [Realm](#) in 2019, and continued investment in the Atlas platform, MongoDB is well on its way to matching (or exceeding) the mobile development feature set of Firebase, while offering many more tools for using data outside of the application development space.

# How do Firebase and MongoDB performance compare?

Firebase and MongoDB are both designed to perform well at scale, but given MongoDB's configurability and the range of Atlas performance tiers, it's hard not to say that MongoDB comes out on top when it comes to pure performance. Third party [sites regularly conclude](#) that MongoDB outperforms Firebase, though of course it comes down to your specific problem space and usage pattern.

It makes sense that MongoDB is higher performance: it's designed to handle the same kind of online transaction processing as relational stores, with real-time applications and fast-moving data pipelines in mind.

## Which is better for app development?

Both MongoDB and Firebase are fantastic tools for mobile application development. If you're looking for a full back-end as a service (BEaaS) and the least possible effort, Firebase is ideal, but MongoDB (and specifically MongoDB Atlas) gives you the most powerful and flexible platform for application development, and the ability to support both transactional and warehouse-style workloads in the same system.

## When to use Firebase vs MongoDB

The rule of thumb is, if you're building a small project or dedicated mobile application, and you don't mind the lock-in to one cloud provider, Firebase is a great place to start. If you're looking for a more general-purpose data solution, value performance at scale and advanced querying, MongoDB is going to serve your needs best. And if you're somewhere in between - check out [MongoDB Atlas](#)!

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