Google Cloud Firestore

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Meet Our Group

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I think skyline should be a fragrance

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Overview

NAME

Google Cloud Firestore:

Cloud Firestore is an auto-scaling document database for storing, syncing, and querying data for mobile and web apps. It offers seamless integration with other Firebase and Google Cloud Platform products.

PRIMARY MODEL

A NoSQL document-oriented database system

COMPANY INFORMATION

Google Cloud:

Consists of a set of physical assets, such as computers and hard disk drives, and virtual resources that are contained in Google's data centers around the globe

NoSQL Database Document Stores

Document stores are characterized by their schema-free organization of data

What does that mean??

- Records do not need to have a uniform structure
- For individual columns, the types of the values can be different for each record
- The columns can have more than one value.
- The records can have a nested structure.

Document stores often use internal notations, these can be processed directly in applications like JSON.

History and Life Cycle

- Influenced by Google's NoSQL database, Datastore (2011)
- Introduced as beta in 2017
- Scalable, fully managed cloud-based database for web and mobile app data storage, management, and synchronization
- Automatic scaling and built-in security
- User-friendly web console for easy database management
- Developers do not need to worry about infrastructure or maintenance
- Google regularly introduces new features and capabilities

Intended Usage

Built For Developers

The intended usage was for developers to use Firestore as a web and mobile application database.

Responsive Applications

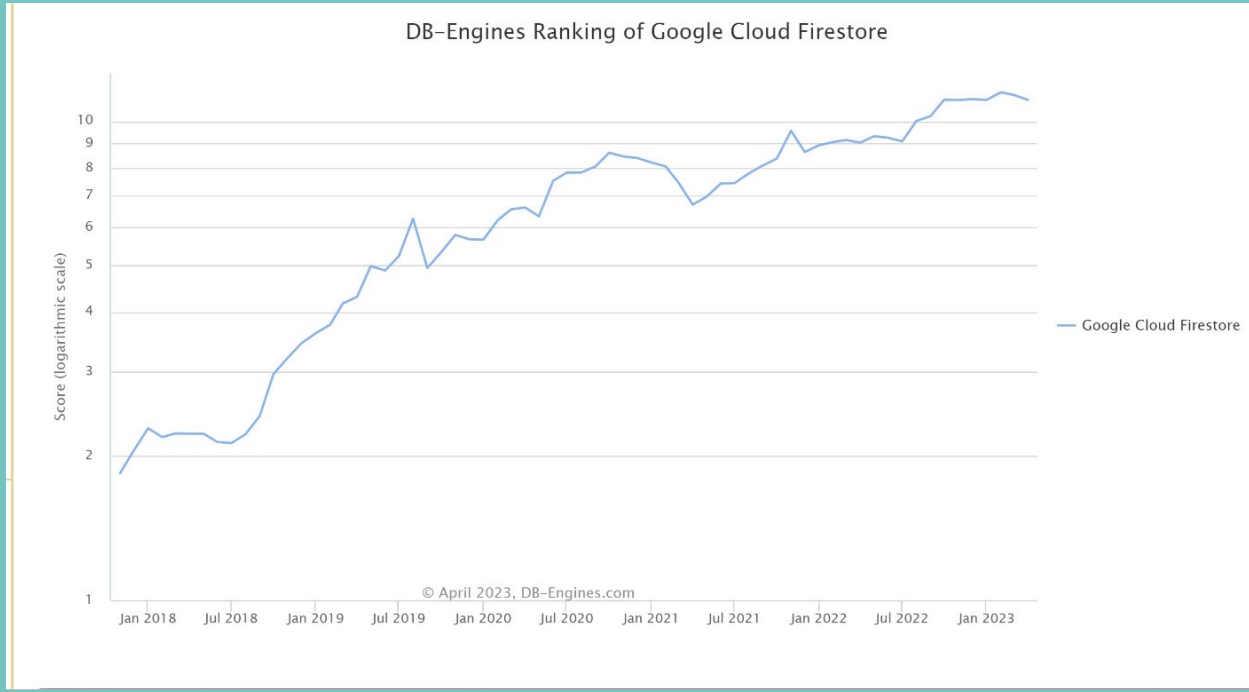
It is meant to offer real-time data synchronization, enabling developers to create responsive applications that could handle millions of users and data updates at once.

Seamless Integration

Being a Google service, it is also meant to synchronize with other Google services seamlessly, allowing for better integration and tooling.

DB-Engines Ranking –

Trend of Google Cloud Firestore Popularity



Score:

11.09

Rank:

#46 Overall

#8 Document stores

Features that make Firestore Unique

Real-time data synchronization	Cloud Firestore updates in real-time as data changes. This feature makes it easy to build collaborative applications that can handle multiple users and data updates.
Serverless and fully managed	This means that developers do not need to worry about infrastructure or maintenance, as Google handles all of that for them.
Multi-region support	Cloud Firestore offers multi-region support, allowing developers to store their data in multiple regions for better performance and reliability. This feature ensures that applications can handle high volumes of traffic without compromising performance.
Powerful Querying	Firestore's powerful querying capabilities allow developers to retrieve data quickly and efficiently. The service supports complex queries, sorting, filtering, and pagination.
Offline Support	Users can continue to use an application even when they are not connected to the internet. The service automatically synchronizes data with the server when the user is back online.
Built-in Security	Firestore offers robust security features, including role-based access control, encryption at rest, and network security controls. This ensures that data is secure and protected from unauthorized access.

What does a NoSQL document DB look like?

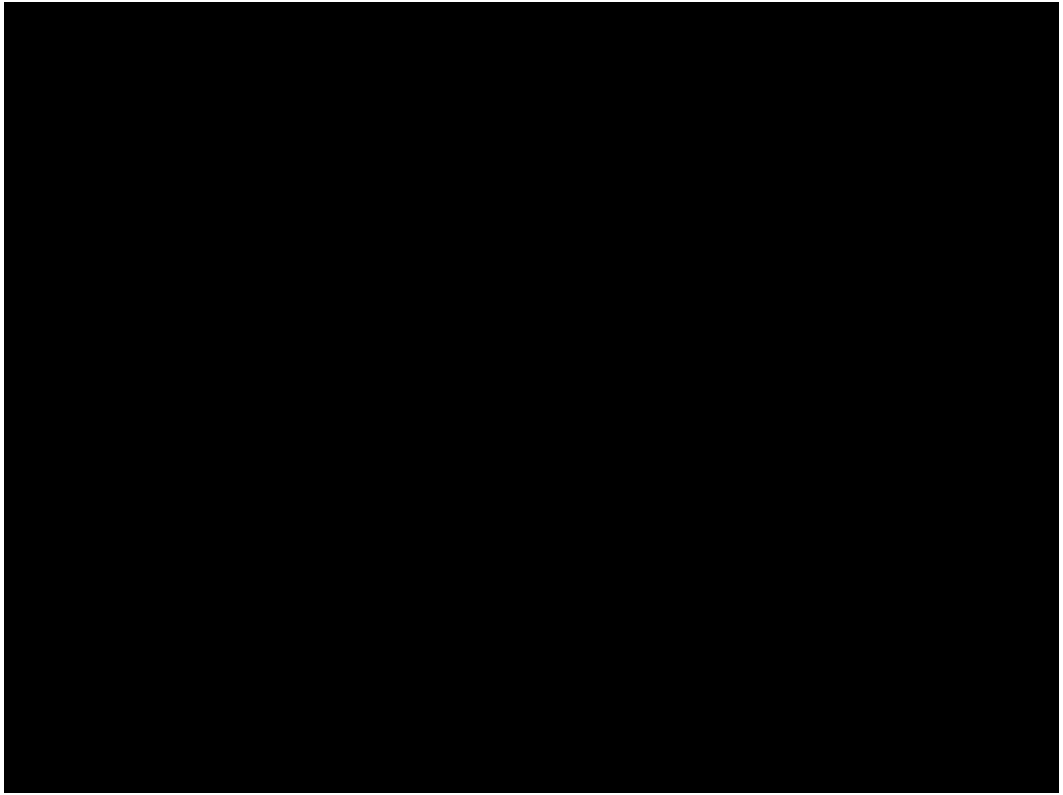
The data structure is a NoSQL document database, meaning each entry can have different attributes. In the example below, the entries have a different combinations of attributes. All of them have a title, but it is not required for each entry to have at least one of the same attribute. They come automatically with a Document ID and you cannot remove this.

Document ID	award	rating	title	year
ETHqtMChNPSUCXVb9aL5	"Highest Grossing Film"		"Gone with the Wind"	1940
d205R6r9IiRe08TLSDka		"PG"	"Tangled"	2010
qMPMjmDf4Nv3ophOJgHE			"The Martian"	2015
wvRF2QxdyjS3wIezkBXc			"Avatar 3"	

Rows per page: 50 ▾ 1 – 4 of 4 < >

Query demo

Querying data is real easy with Firestore. You simply add a query by clicking a button, and then fill out the rest with the options Firestore prefills for you.



Challenges / Issues

Importing Data

A user can only import data that has previously been exported by Firestore.

Expense Monitoring

Firestore does not give the user a way to check how much storage they have or how much new data they're creating. The only this given is a "storage used" on the users GCP bill.

Limited Processing Capabilities

The user is unable to compute values based on query results directly in the database. It also does not allow for joins or negated queries.

Limited Indexing

Firestore allows you to create indexes for specific queries, but there are limitations on the number of indexes you can create and the complexity of the queries they support.

Relevant Documentation

Firestore Documentation

https://firebase.google.com/docs/firestore

Google Cloud Overview

https://cloud.google.com/docs/overview

Resources

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Google Cloud Docs Overview

Slide 4

DB Engine Definitions

Slides 5, 6, and 8

ChatGPT

Slide 7

DB Engine Rankings

Slide 9

SQL Image

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