

AWS:

- **Relational database:** *Amazon RDS*: " Amazon Relational Database Service (Amazon RDS) makes it easy to set up, operate, and scale a relational database in the cloud. It provides cost-efficient and resizable capacity while automating time-consuming administration tasks such as hardware provisioning, database setup, patching and backups." [<https://aws.amazon.com/rds/>] Price: Free trial, according to used resources.
- **Key-value:** *DynamoDB*: " Amazon DynamoDB is a key-value and document database that delivers single-digit millisecond performance at any scale." [<https://aws.amazon.com/dynamodb/#:~:text=Amazon%20DynamoDB%20is%20a%20key,millisecond%20performance%20at%20any%20scale.&text=DynamoDB%20can%20handle%20more%20than,20%20million%20requests%20per%20second.>] Price: \$1.25 per million requests, \$0.25 per read only requests.
- **Document:** *DocumentDB*: " Amazon DocumentDB is a fully managed document database from AWS. A document database is a type of NoSQL database that allows you to store and query rich documents in your application." [<https://aws.amazon.com/getting-started/hands-on/purpose-built-databases/documentdb/#:~:text=Amazon%20DocumentDB%20is%20a%20fully,rich%20documents%20in%20your%20application.>] Price: Many options.
- **In-memory:** *Elasticache for redis*: " An in-memory database is a type of purpose-built database that relies primarily on memory for data storage, in contrast to databases that store data on disk or SSDs. In-memory databases are designed to attain minimal response time by eliminating the need to access disks." [<https://aws.amazon.com/nosql/in-memory/#:~:text=An%20in%2Dmemory%20database%20is,the%20need%20to%20access%20disks.>] Price: Pay per resources used.
- **Graph:** *Amazon Neptune*: "Graph databases, like Amazon Neptune, are purpose-built to store and navigate relationships. They have advantages over relational databases for use cases like social networking, recommendation engines, and fraud detection, where you need to create relationships between data and quickly query these relationships." [<https://aws.amazon.com/neptune/#:~:text=Graph%20databases%2C%20like%20Amazon%20Neptune,and%20quickly%20query%20thes>] Price: Many options of pricing.
- **Time series:** *Amazon Time Stream*: " Amazon Timestream is a fast, scalable, and serverless time series database service for IoT and operational applications that makes it easy to store and analyze trillions of events per day up to 1,000 times faster and at as little as 1/10th the cost of relational databases." [<https://aws.amazon.com/timestream/>] Price: \$0.5 per million write requests (1KB), and time memory options.

- **Ledger:** *Amazon QLDB* "Amazon QLDB is a fully managed ledger database that provides a transparent, immutable, and cryptographically verifiable transaction log owned by a central trusted authority. Amazon QLDB can be used to track each and every application data change and maintains a complete and verifiable history of changes over time." [https://aws.amazon.com/qldb/#:~:text=Amazon%20QLDB%20is%20a%20fully,history%20of%20changes%20over%20time.] Price: \$0.7 per million write requests, \$0.136 per million read requests.

Azure:

- **Relational databases:** "*Microsoft Azure SQL Database* is a managed cloud database provided as part of Microsoft Azure. A cloud database is a database that runs on a cloud computing platform, and access to it is provided as a service. Managed database services take care of scalability, backup, and high availability of the database." [https://en.wikipedia.org/wiki/Microsoft_Azure_SQL_Database]
- **Key-value:** "*Azure Cosmos DB*: Azure Cosmos DB table API is a key-value storage hosted in the cloud. It's a part of Azure Cosmos DB, that is Microsoft's multi-model database. It's a globally distributed, low latency, high throughput solution with client SDKs available for .NET, Java, Python, and Node.js." [https://www.michalbialecki.com/2018/03/18/azure-cosmos-db-key-value-database-cloud/] Price: \$200 for the trial month.
- **Document:** *DocumentDB* "Document databases extend the concept of the key-value database by organizing entire documents into groups called collections. They support nested key-value pairs and allow queries on any attribute within a document." [https://azure.microsoft.com/en-gb/overview/nosql-database/] Price: many options.
- **In-memory:** "*In-Memory OLTP* is built into Azure SQL Database, and you can use all these objects in any Premium database. And because these objects behave very similar to their traditional counterparts, you can often gain performance benefits while making only minimal changes to the database and the application." [https://azure.microsoft.com/en-us/blog/in-memory-oltp-in-azure-sql-database/#:~:text=In%20Memory%20OLTP%20is%20built,the%20database%20and%20the%20application.] Price: Many options.
- **Graph:** *Cosmos DB*: "A graph database is a collection of nodes (or vertices) and edges (or relationships). A node represents an entity (for example, a person or an organization) and an edge represents a relationship between the two nodes that it connects (for example, likes or friends). Both nodes and edges may have properties associated with them" [https://docs.microsoft.com/en-us/sql/relational-databases/graphs/sql-graph-overview?view=sql-server-ver15] Price: many options.
- **Time series:** *Cosmos DB*: "Time series data is a set of values organized by time. Examples of time series data include sensor data, stock prices, click stream data, and application telemetry. Time series data can be analyzed for historical trends, real-time alerts, or predictive modeling." [https://docs.microsoft.com/en-us/azure/architecture/data-guide/scenarios/time-series#:~:text=Time%20series%20data%20is%20a,time%20alerts%2C%20or%20predictive%20modeling.] Price: pay for what you use.

- **Ledger:** "Azure Blockchain Workbench Preview delivers data from distributed ledgers to an off-chain SQL DB database. The off-chain database makes it possible to use SQL and existing tools, such as SQL Server Management Studio, to interact with blockchain data." [https://docs.microsoft.com/en-us/azure/blockchain/workbench/database-views#:~:text=Azure%20Blockchain%20Workbench%20Preview%20delivers,to%20interact%20with%20blockchain%20data.]; " Ledger Database — A NoSQL database that provides an immutable, transparent, and cryptographically verifiable transaction log owned by a central authority." [https://medium.com/a-technologists-pov/do-i-need-a-ledger-database-what-is-it-6f3b7261238#:~:text=Ledger%20Database%20%E2%80%94%20A%20NoSQL%20database,Let's%20break%20this%20down.] Price: many options.

Google:

- **Relational database:** *Bare Metal Solution, Cloud SQL, Cloud Spanner.* "" [https://cloud.google.com/datastore] Price: Many options.
- **Key-value:** *Cloud Bigtable.* " Datastore is a highly scalable NoSQL database for your web and mobile applications." [https://cloud.google.com/datastore] Price: \$0.65 per hour of production and development.
- **Document:** *Firestore, Firebase Realtime Database.* " Cloud Firestore is a flexible, scalable database for mobile, web, and server development from Firebase and Google Cloud." [https://cloud.google.com/datastore] Price: Many options.
- **In-memory:** *Memorystore.* " Fully managed Redis and Memcached for sub-millisecond data access." [https://cloud.google.com/datastore] Price: many options.
- **Graph:** Does not have.
- **Time series:** Does not have.
- **Ledger:** *Cloud spanner* "Global financial ledger". [https://cloud.google.com/products/databases] Price: many options.

Use case:

- **Relational database:** "A relational database is a digital database based on the relational model of data" [https://en.wikipedia.org/wiki/Relational_database]
- **Key-value:** "A key-value database is a type of nonrelational database that uses a simple key-value method to store data." [https://aws.amazon.com/nosql/key-value/#:~:text=A%20key%20value%20database%20is,objects%20to%20complex%20compound%20objects.]

- **Document:** "A document database is a type of nonrelational database that is designed to store and query data as JSON-like documents." [https://aws.amazon.com/nosql/document/#:~:text=A%20document%20database%20is%20a,use%20in%20their%20application%20code.]
- **In-memory:** "An in-memory database is a type of purpose-built database that relies primarily on memory for data storage, in contrast to databases that store data on disk or SSDs. In-memory databases are designed to attain minimal response time by eliminating the need to access disks. Because all data is stored and managed exclusively in main memory, it is at risk of being lost upon a process or server failure." [https://aws.amazon.com/nosql/in-memory/#:~:text=An%20in%20memory%20database%20is,data%20on%20disk%20or%20SSDs.&text=Because%20all%20data%20is%20stored,a%20process%20or%20server%20failure.]
- **Graph:** "Very simply, a graph database is a database designed to treat the relationships between data as equally important to the data itself. It is intended to hold data without constricting it to a pre-defined model." [https://neo4j.com/developer/graph-database/#:~:text=Very%20simply%2C%20a%20graph%20database,to%20a%20pre%20defined%20model.]
- **Time series:** "A time series database (TSDB) is a database optimized for time-stamped or time series data. Time series data are simply measurements or events that are tracked, monitored, down sampled, and aggregated over time. " [https://www.influxdata.com/time-series-database/#:~:text=A%20time%20series%20database%20(TSDB,downsampled%2C%20and%20aggregated%20over%20time.)]
- **Ledger:** "A distributed ledger is a database that is consensually shared and synchronized across multiple sites, institutions, or geographies, accessible by multiple people. It allows transactions to have public "witnesses"." [https://www.investopedia.com/terms/d/distributed-ledgers.asp#:~:text=A%20distributed%20ledger%20is%20a,to%20have%20public%20%22witnesses%22.]

App/software:

- **Relational database:** Microsoft Windows.
- **Key-value:** Python Dictionary data structure.
- **Document:** Visual Studio Code.
- **In-memory:** ArangoDB
- **Graph:** Neo4j.
- **Time series:** influxDB
- **Ledger:** Amazon Quantum Ledger.

Price:

- **Relational database:** Depends on the plan that is chosen.
- **Key-value:** Depends on the plan that is chosen.
- **Document:** Depends on the plan that is chosen.
- **In-memory:** Depends on the plan that is chosen.
- **Graph:** Depends on the plan that is chosen.
- **Time series:** Depends on the plan that is chosen.
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