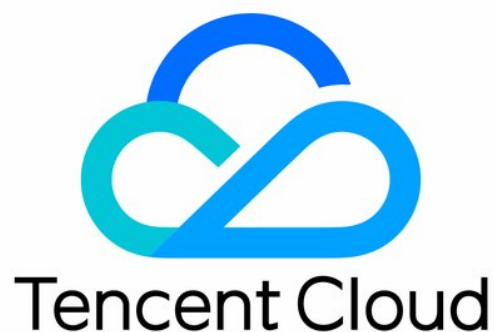


Cloud Native Database TDSQL- C

Product Introduction Product Documentation



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Overview

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Cloud Native Database TDSQL-C (TDSQL-C for short) is a new-generation enterprise-grade distributed cloud database developed by Tencent Cloud. It features high performance and availability and combines the strengths of traditional databases, cloud computing, and cutting-edge hardware technologies. It is compatible with MySQL and PostgreSQL and able to achieve a high throughput of over one million QPS and a massive distributed smart storage capacity of 128 TB, comprehensively ensuring data security and reliability.

Note :

TencentDB for CynosDB was renamed TDSQL-C on December 24, 2020.

TDSQL-C Architecture

Customized kernel

The deeply customized database kernel of TDSQL-C empowers many enterprise-grade features and optimizations. It serves Tencent Cloud's internal users and external users at the level of hundreds of terabytes as the cornerstone of supporting the smooth operations of key businesses.

Log as a database

TDSQL-C is a computable smart storage service. Its distributed storage system automatically manages multiple data replicas to implement auto scaling, fault check, and repair. It adopts the concept of log as a database, which truly sinks the redo logs to the storage layer and minimizes the network I/O.

Service-Oriented architecture

The architecture of TDSQL-C is based on existing Tencent Cloud services such as COS, CBS, CVM, VPC, and TGW.

Mix of software optimization and new hardware

Through SPDK- and RDMA-based zero copy technologies, TDSQL-C reduces the performance losses caused by OS context switching and data copying between user mode and kernel mode, further

optimizes the system performance at critical paths, and minimizes the request delay.

Core Design Concepts of TDSQL-C

Cloud native: TDSQL-C is service-oriented.

Creative: TDSQL-C separates computing and storage and implements the concept of log as a database.

Comprehensive: TDSQL-C is fully compatible with new open-source databases.

Cohesive: TDSQL-C features minimalist software optimizations to release the hardware dividend.

Cost-Effective: TDSQL-C doubles the database performance and is pay-as-you-go.

Strengths

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Full Compatibility

TDSQL-C separates the computing and storage of open-source databases. The storage is built on Tencent Cloud's distributed cloud storage service, and the computing layer is fully compatible with open-source database engines MySQL 5.7 and PostgreSQL 10, so that your businesses can be smoothly migrated without modifications.

Ultra-High Performance

The ultra-high performance of a single node can sustain millions of QPS, which meets the requirements in high-concurrency and high-performance scenarios, ensures the continuity of key businesses, and further provides read/write separation and read/write scalability.

Massive Storage Capacity

TDSQL-C has a massive storage capacity of up to 128 TB in the serverless architecture and features auto scaling, fault check, and repair. It is pay-as-you-go, so you only need to pay for what you use. It helps you easily cope with dynamic changes and continuous growth of your business data volume. In addition, it automatically maintains multiple data replicas to ensure the data security and reliability.

Fast Fault Recovery

Compute nodes are stateless and support failover and recovery within seconds. Even if the physical machine where a compute node resides is down, it can be recovered in less than one minute.

Fast and Flexible Configuration Adjustment

Compute nodes can be quickly upgraded/downgraded according to business needs without causing disconnections. Upgrade/Downgrade can be completed within seconds at the soonest subject to the memory size, which optimizes the costs of computing resources.

Fast Read-only Scaling

1-15 read-only compute nodes can be quickly added in a cluster within seconds, enabling fast response to business surges and fluctuations.

Snapshot Backup and Restoration

The fast snapshot backup feature based on multiple replicas of data provides continuous backup protection for your data and eliminates the need for sync and migration of backup data in the

primary-secondary architecture. Up to gigabytes of data can be rolled back per second, ensuring the rapid restoration of business data.

Use Cases

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Enterprise Applications Requiring High Availability and Performance

- Commercial database-grade high performance, high reliability, and low cost make TDSQL-C the best choice for mission critical businesses. Its multiple custom-developed kernel optimizations and enterprise-grade features ensure smooth and efficient business operations, so that R&D personnel can focus on the development of business logic without worries.
- TDSQL-C solves the problems of poor flexibility, low sync efficiency under high business pressure, and uncontrollable switch time in the traditional primary/secondary architecture. It ensures high system availability and business continuity while delivering high performance, which greatly reduces the workload of operations and OPS personnel.
- TDSQL-C is compatible with open-source MySQL and PostgreSQL, so that your existing business applications can be connected to TDSQL-C with almost no changes required, helping you cloudify your business smoothly.
- TDSQL-C has a built-in high availability architecture and automatically maintains multiple data replicas, checks data, and fixes errors, which reduce human intervention and achieve a data reliability of up to 99.9999999%.

Internet and Gaming Businesses

- TDSQL-C has agile and flexible scalability, which means that you don't need to purchase storage capacity in advance. It can quickly upgrade/downgrade according to your business needs for fast scaling and easy response to business peaks.
- TDSQL-C offers a massive storage capacity of 128 TB that can be automatically expanded. It eliminates the tedious operations of region and server merges and optimizes resource allocation and costs.
- TDSQL-C features fast snapshot backup and rollback, which provides continuous protection for your data based on multiple replicas, making it an ideal database in the internet and gaming industries.

Serverless Service

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TDSQL-C Serverless Edition adopts the serverless architecture for cloud native database services. It is billed based on the actual computing and storage resource usage, so you only need to pay for what you use while enjoying the cloud native technologies of Tencent Cloud.

Service Features

- **Autopilot:** the database can automatically start/stop according to the business load and scale in an imperceptible manner without causing disconnections.
- **Utility pricing:** the database is billed based on the actual computing and storage usage which is calculated by second and settled by hour.

Use Cases

- Low-Frequency database usage scenarios such as development and test environments.
- Scenarios where the load is uncertain, such as IoT and edge computing.
- SaaS application scenarios such as Mini Program Cloud Base and SME website development.

Billing Modes

Computing and storage are billed separately: computing is billed by the number of CCUs, while storage is billed by the usage in GB. The billing system calculates the usage by second and settles fees by hour. For detailed prices, please see [Billing Overview](#)

CynosDB Compute Unit (CCU) is the computing and billing unit for the Serverless Edition. A CCU is approximately equal to 1 CPU core and 2 GB memory. The number of CCUs used in each billing cycle is the greater of the number of CPU cores used by the database and 1/2 of the memory size.

You can select the maximum and minimum CCUs your database requires on the [purchase page](#) according to your business conditions. You can also change them in the [console](#).

Compute Unit Min Max

Select the maximum and minimum compute unit as needed. [Learn More](#)

Service Management

Pausing service

- You can enable/disable the auto-pause feature in the [console](#) according to your business needs.
 - After this feature is enabled, you need to set the auto-pause time, which is one hour by default. The database will be automatically paused if it has no active connections and CPU usage after this time elapses. After the pause, the computing resources will not be billed, and the storage resources will be billed by the actual usage.
 - If this feature is disabled, the database will keep running. When there are no active connections and CPU usage, the database will be billed based on the minimum CCU you configure. This is suitable for scenarios where your business has a heartbeat connection.

Auto-Pause The database automatically pauses if it is inactive for the time period specified here, and automatically resumes when database activity recurs. After the database is paused, the compute resources are not billed. If auto-pause is disabled, the database keeps running.

- You can also manually pause specified databases in the console.

Cluster ID/Name	Cluster ...	Compatible Database	Region	Private Network Add...	Billing... ▾	Project ▾	Expiration Time ↕	Instan...	Operation	
<input type="checkbox"/>		Running	MYSQL	South China (Guangzhou)		Serverless	DEFAULT PR...	--	1	Log In Manage More ▾
<input type="checkbox"/>		Running	MYSQL	South China (Guangzhou)		Monthly S...	DEFAULT PR...	Expire on 2022-06-25...	1	Delete Security Group Edit Tag Pause

Starting service

You cannot use the features in the [console](#) for a paused serverless database. If needed, you can wait until the database is automatically started or manually start it the console.



When a paused database is accessed, the system will automatically start it in seconds. During the short startup process, the application may receive the following error messages; therefore, the business should have a reconnection mechanism.

```
ERROR 9449 (08S01): CynosDB serverless instance is resuming, please try connecting again
ERROR 2003 (HY000): Can't connect to MySQL server on 'xxxx' (111)
```

```
1607483553705
ERROR 9449 (08S01): CynosDB serverless instance is resuming, please try connecting again
1607483553729
ERROR 9449 (08S01): CynosDB serverless instance is resuming, please try connecting again
1607483553754
ERROR 2003 (HY000): Can't connect to MySQL server on '192.168.1.100' (111)
1607483553774
ERROR 9449 (08S01): CynosDB serverless instance is resuming, please try connecting again
1607483553799
ERROR 9449 (08S01): CynosDB serverless instance is resuming, please try connecting again
1607483553824
ERROR 2003 (HY000): Can't connect to MySQL server on '192.168.1.100' (111)
1607483553843
ERROR 9449 (08S01): CynosDB serverless instance is resuming, please try connecting again
1607483553869
ERROR 9449 (08S01): CynosDB serverless instance is resuming, please try connecting again
1607483553895
ERROR 2003 (HY000): Can't connect to MySQL server on '192.168.1.100' (111)
1607483553915
```