

Payment Processing Solutions

Online, mobile, card-free payment processing has exploded onto the scene over the last several years. Consumers expect to be able to order and pay for items on multiple devices and merchants expect immediate access to the transactions for analysis of buying trends. As more and more payment service providers enter the space, both existing Fintech companies and startups need to constantly innovate, leveraging the latest and greatest technologies to develop new products and services to compete and win in today's rapidly changing business environment.

The Challenges

Coping with Unpredictable Growth

For payment services, scalability is a chief concern. Many payment service providers offer customers and merchants apps which are likely "super apps". These apps are intended to extend beyond the initial design and aggregate multiple payment products and non-payment services. Along with this need to accommodate unpredictable growth is the requirement for security and compliance. Payment services is a volume-based business: as more customers and merchants get onboard and the service expands to more regions, payment service providers experience tremendous growth within a short period of time.

Additionally, these apps serve two distinct user communities: the consumer and the merchant. Each of these user groups has distinct, and often disparate, needs. While these communities have different requirements of the database, both require data availability and a secure transaction environment.

Combining the need for fast transactions, data security, and availability, access to multiple user communities, and fraud detection lead many companies to a solution that combines multiple technologies. In these scenarios, data transfer and staleness are definite concerns. TiDB solves these problems by providing speed and secure transaction processing plus real-time analytics for fraud detection in a single source.

Payment Data Monetization

As the payment services cover more customers and more merchants, service providers will accumulate large volumes of data. Whether it is used to generate insights about customer behavior for targeted marketing, or to offer merchants with lines of credit, payment service providers are taking steps to monetize the data to create new revenue streams. The technical infrastructure not only needs to support the growth but is also required to provide analytics capabilities on fresh data.

Exceeding Customer Expectation

Customers and merchants are switching to payment service providers for their volume-based low transaction fees and, more importantly, the frictionless onboarding and underwriting

process. To survive and gain competitive advantages, payment solution providers must constantly seek to exceed customer and merchant expectations. Therefore, innovation is the norm rather than exception. The product and technical team must collaborate closely and in an agile way to deliver new products and value-added services to the market in a timely manner to attract and retain customers.

The TiDB Solution

Easy to Scale Database Infrastructure

TiDB accommodates unpredictable usage patterns with the ability to scale in, out, up, or down as needed. Eliminating sharding from the solution enables better, faster, and easier scalability. By decoupling storage and compute capabilities, organizations are enabled to scale as needed and where needed with ease. Scalability is no longer a challenge for distributed systems as TiDB allows you to scale out and rebalance the data with no downtime, little manual intervention, and no disruption or modification to the application. Whether your application is compute-intensive or data intensive, you can scale out TiDB according to the actual workload. In addition, you do not need to worry about archiving the data periodically. Data retention is theoretically unlimited with a distributed database and searching historical data for auditing purposes or upon customer service requirement is at your fingertips.

Real-time Translytical Capabilities

With Hybrid Transactional and Analytical Processing (HTAP) capabilities, TiDB delivers real-time data monetization by providing immediate translytical capabilities, allowing an organization to shift to meet changing demands. Data is written to a row store, for fast transaction processing, but then, through standard replication, that data is also written to a column store for analytics. Operational analytics helps to detect and prevent fraudulent transactions, identify business trends, and delivers the data-driven analytics that is required for day-to-day business.

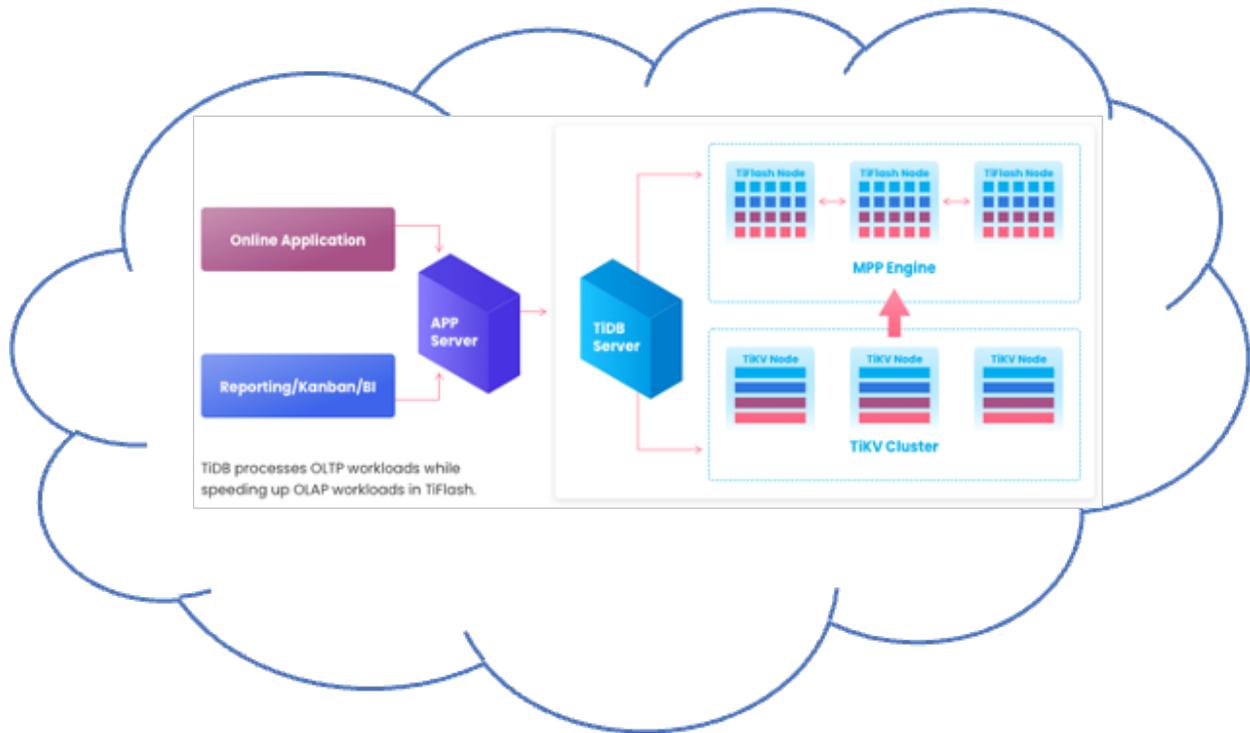
Compliance with Changing Regulations

Inherent high availability and financial grade security provide business continuity and certainty that your data is protected. Financial grade data security and auditing meet compliance requirements and provide additional trustworthiness. TiDB has built-in high availability and disaster recovery solutions, whether it is running in a multi-availability zone or multi-region environment.

With the horizontal scalability of TiDB, you can keep years of data online to comply with new data retention rules. With online DDL, it is easy to change schema as new regulatory requirements emerge.

Finally, by removing the need for separate systems for transactions and analytics, operating expenses are contained and more easily controlled. Our agile, open-source model ensures that you continue to meet the ever-changing needs of your payment app.

Architecture



TiDB initially processes a write request to the row store. From there, it is replicated to other nodes in the row store and the column store. Data is written first to TiKV, which is the row store, since it provides the speed needed for massive OLTP. Next, the data is replicated to TiFlash, the column store. Data replication is peer to peer with no in-between layer, so the data is replicated in real-time.

The fact that the data is written to both a row and column store through standard replication means that your data is always available and up to date. The ability to run real-time analytical queries in a single database ensures easy access to all the information you need.

As a cloud-native database, TiDB can run fully in the cloud, on premises, or in a hybrid environment. The choice is yours to make.

Customer Experiences

A commercial bank needed a distributed SQL database that could accommodate their transaction load and provide operational analytics to deal with the rapidly changing financial marketplace. They implemented three data centers in two different cities to ensure continuous data access and, on a key shopping day, processed 10x transactions through TiDB.

A mobile payment application built on top of a chat application needed to scale to serve a million requests per day. They required scalability, resiliency, always-on availability, performance monitoring, and guaranteed security. With TiDB, they meet their current needs and are assured of their ability to continue to scale to meet changing requirements.

An insurance company provides a variety of services to over 10 million daily active users. They needed a database that could scale to meet their growth demands and had a high level of transaction security. They moved to TiDB from Oracle and immediately saw claims processing completing in a few hours, where it used to take multiple days. On their busiest day, they managed \$15B USD of transactions in a single day for several million users.

Additional Resources

[Using TiDB in Mission Critical Scenarios of the Financial Industry](#)

[Choosing the Right Enterprise-Grade Disaster Recovery Solution for the Financial Industry](#)

[How a NewSQL Database Helps Keep Data Fresh and Maximize Its Business Value](#)