

# Real-Time Answers in a Fast Data World

Are you set up for success?



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## Building Real-Time Applications for a Digital-First World

The era of Big Data has come and gone: You use it. Several data architectures support it. That's the good news.

But now you're facing an era of real time — where insights and decisions need to be made instantly, in the moment. Unfortunately, very few underlying data architectures are optimized to power **real-time applications and insights**. In fact, most databases cannot ingest and process the millions of events per second that many of today's businesses routinely generate, while concurrently querying that data in milliseconds to deliver the multitudes of personalized experiences customers expect, at scale.

The inability to meet this growing need is more than just a modern inconvenience, it is quickly becoming a strategic impediment; one that, over time, can undermine your organization's ability to compete.

That's why it's imperative to ask yourself this question: Does your data infrastructure have what it takes to make you successful in today's high-speed, high data-intensity marketplace? Before you answer, consider this:

- Do you have issues with stale, older data in your applications and dashboards?
- Are you dissatisfied with the responsiveness and performance of your apps and dashboards?
- Are you struggling to scale your application due to user or data growth?
- Can your application or dashboard benefit from real-time data for your customers and internal users?

If you answered "yes" to any of these questions, it's time to make the move to real time.

## The Need for Real Time

In today's rapidly changing business environment, real-time decision making is critical for companies of all sizes. Companies that continue to rely on stale data and analytics, served up on slow apps and dashboards with limited interactivity and responsiveness, have a built-in disadvantage. Because when business leaders lack the latest data, poor decisions are made and market opportunities are missed.

And the bad news doesn't end there. Slow and stale data flow also contributes to poor customer and end-user experiences, which can negatively impact sales and lead to employee, partner and customer churn.

Fast data is the next major competitive differentiator in business. An organization's ability to access data about every aspect of its business (customers, transactions, supply chains, asset performance, etc.) in real time and transform them into immediate, meaningful insights to act upon is an immensely powerful competitive advantage. Organizations able to implement the needed data infrastructure and operationalize it behaviorally will be the winners of tomorrow.

That's why the need to move to real time is growing more urgent every day.



## Fast Data Changes All of This

Fast data is the new fuel organizations use to power real-time decision making. It enables them to process ALL of their data — including data-at-rest from existing information stored within their database(s) to fast streaming, data-in-motion, which includes real-time customer interactions, supply chain data, sensor data and other real-time external data sources. These need to be combined to provide customers and users with fast, easy access to the latest insights and data via responsive apps and dashboards. This enables employees, partners and customers to use complete data to spot trends as they're happening, capture new business opportunities and make faster, better decisions in real time.

Organizations that have successfully implemented real time achieve remarkably positive business outcomes quickly, including stronger customer and end-user experiences, higher business growth rates and increased operational efficiencies.

According to the “[Speed to Business Value Report](#),” conducted in the U.S. by the Centre for Economics & Business Research, substantial commercial and operational advantages can be gained by businesses adopting real-time data analytics technologies, including:

**Bigger Bottom-Line Benefits:** Survey results showed that companies across the four industry sectors in the U.S. reported an 18% average recognized revenue increase, with potential for more.

- **Bigger bottom-line benefits:** Survey results showed that companies across the four industry sectors in the U.S. reported an 18% average recognized revenue increase, with potential for more.
- **Increased optimization:** More than \$187 billion overall could be saved by U.S. businesses because of a reduction in non-people operational costs.
- **Improved customer feedback:** U.S. businesses saw a significant increase in positive customer experiences after implementing real-time data analytics, particularly within finance and insurance (44%) and telecoms (42%).
- **Reduced anomalous activity:** In the U.S., 84% of manufacturers saw at least a moderate reduction in anomalous operational or financial activity, while 83% reported the same in telecoms.
- **Greater productivity and proficiency:** U.S. respondents developed more efficient rollout processes, as reported by 73% of American manufacturers, and greater efficiencies, as reported by 67% of U.S. firms in finance and insurance.

These findings indicate that by implementing real-time data technologies, businesses can realize significant value. From process improvements to cost reductions and tangible impact on business revenues, the benefits are wide reaching. Now that the value of real time is clear, how do you get there?

There was a steep trade-off, though. While these new architectures were self-contained and highly elastic, they were non-relational, forfeiting SQL's declarative query powers. Speed and scale were readily attainable, but second-generation datastores left behind SQL's ability to do joins, aggregations and analytics within a query. Instead, instructions on where to find the data (its physical location in the database) had to be spelled out, introducing another burdensome category of complexity to the cloud database challenge.

# SingleStoreDB: The Real-Time, Unified, Distributed SQL Database

SingleStoreDB is the world's fastest distributed SQL database for real-time analytical applications. Built on a modern, distributed, cloud-native architecture, SingleStoreDB is designed to deliver maximum performance for both transactional (OLTP) and analytical (OLAP) workloads in a single engine, driving low-latency performance and interactivity for modern applications — while scaling access to tens or hundreds of thousands of concurrent users, without complex application rewrites or data migrations.

With SingleStoreDB, you can move beyond your legacy data architecture that can't support real-time interactive applications and use cases to a single, ludicrously fast database that unifies your data, supports multiple workloads concurrently and enables you to generate breakthrough experiences.

- Power interactive, real-time applications and analytics
- Process transactions and analytics, in the same engine with no data movement
- Support all data types — structured, semi-structured, unstructured
- Generate real-time insights via single-pane-of-glass experience

Sounds too good to be true? Keep reading.

## Powering Compelling Real-Time Use Cases

SingleStoreDB enables organizations — across a variety of verticals — to drive fast analytics on any data, anywhere, and serve the actionable insights, in real time, across internal and external applications, dashboards and platforms.

### Common Use Cases



**Fraud Prevention  
in Real Time**



**Player Engagement  
in Gaming**



**Real-Time  
Customer Billing**



**Online Portfolio  
Management**



**Interactive  
Business  
Dashboards**



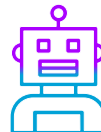
**Real-Time  
Customer Analytics**



**Internet of Things  
(IoT)**



**Machine  
Learning**



**Artificial  
Intelligence**

### Faster data ingestion drives higher revenues.

Industry: **Media & Streaming**

Company: Akamai, the leading content delivery network services provider for media and software delivery, and cloud security solutions.

Challenge: Needed to ingest and process massive amounts of highly active network data fast – a challenging task that many databases simply cannot handle.

Solution: By using SingleStoreDB Pipelines and Kafka together, Akamai can insert data while enabling simultaneous analytical queries.

- Akamai now processes **10-million upserts per second**.
- Faster ingest and processing enables daily billing, **increasing revenue**.

[Read the Case Study →](#)

### Streaming data ingestion fuels business scalability.

Industry: **Global Video Surveillance**

Company: Arcules provides digital security services via its proprietary, device-agnostic, plug-and-play, multi-location video surveillance platform.

Challenge: Scalability impaired by legacy data architecture.

Solution: By replacing PostgreSQL with SingleStoreDB on Google Cloud, Arcules was able to dramatically boost platform speed and scalability.

- **<100 millisecond query** response and video feed ingest speed
- Supports **1,000s of concurrent users**
- **20,000% performance improvement**

[Read the Case Study →](#)

### Faster performance improves security.

Industry: **Global IoT Security**

Company: Armis provides real-time security protection for telemetry and IoT devices.

Challenge: Slow performance due to legacy infrastructure and continued proliferation of IoT devices.

Solution: SingleStoreDB was used to replace Elasticsearch and dramatically accelerated Armis's platform overall.

- Increased platforms ingest capacity to **100 billion events per day**
- Easily handles **30TB data sets** in large customers environs
- **Reduced cost by 70%**

[Read the Case Study →](#)

## High concurrency improves client relationships.

Industry: **Financial Services**

Company: Top Five North American financial services organization.

Challenge: Provide interactive real-time wealth management experience in effort to build more meaningful relationships with high-net-worth clients.

Solution: SingleStoreDB improved the wealth management experience by accelerating client dashboards with fast, consistent response times and high concurrency.

- Enabled company to run more than **50 queries in parallel, with 10-20 millisecond response times.**
- Process **millions of real-time queries across 40,000 users.**
- Users can access up to **20-years** of portfolio history with real-time interactivity.

## High-speed analytics drives real-time decision making.

Industry: **Industrial Manufacturing**

Company: Siemens, a German multinational corporation and the largest industrial manufacturing company in Europe.

Challenge: Improve application and dashboard speeds to dramatically lower response times and enable real-time decision making.

Solution: By combining SingleStoreDB, Kubernetes and AWS into one hybrid containerized app to support Siemens Pulse Analytics, Siemens and its customers can now run analytics and machine learning operations at superlative speeds.

- Speed improvements enable real-time dashboards of **up to 10-100x.**
- Query billions of rows and petabytes in **<100 milliseconds.**
- Auto-scales to accommodate **500 to 100,000 concurrent users.**

[Read the Case Study →](#)

## Real-time analytics improves operations & optimizes revenue.

Industry: **High Tech**

Company: Uber, an American ride-share provider.

Challenge: Needed robust, real-time data on riders and drivers to fuel marketing segmentation and revenue optimization strategies and tactics.

Solution: Delivered real-time data and insights on more than 300 attributes about riders and drivers to 1,000s of employees across marketing, product and leadership teams.

- **Millisecond latency** analytical queries for **>100M events.**

[Read the Case Study →](#)

Real-time exec dashboards support better decision making.

Industry: **Electronics Manufacturing**

Company: Leading mobile phone and electronics manufacturer.

Challenge: Lagging and slow dashboard performance for their most critical sales/supply chain executive dashboards which impacted the ability to make decisions related to product launches, marketing, manufacturing and product strategy.

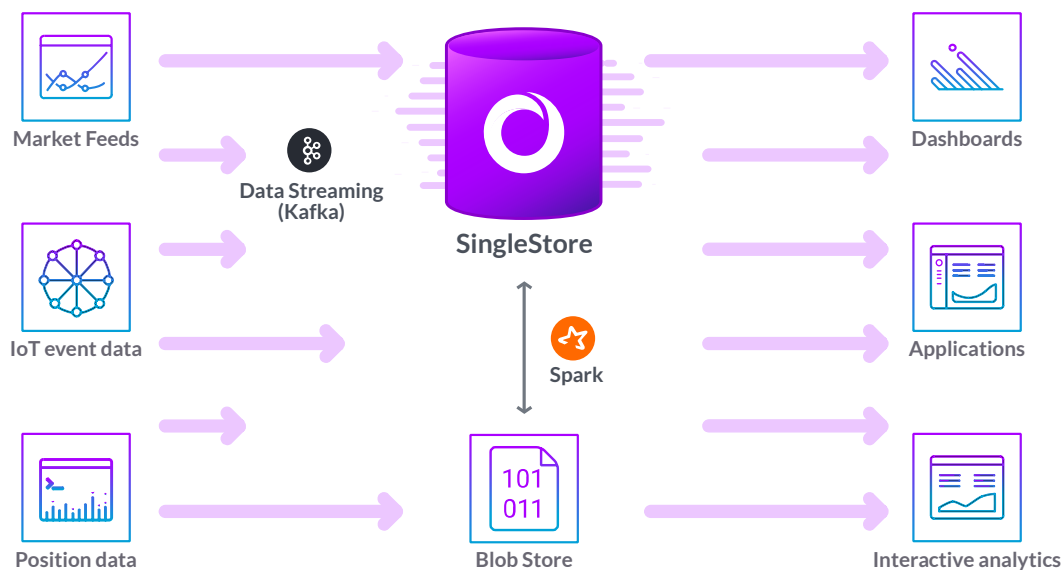
Solution: By augmenting Teradata with SingleStoreDB, they were able to drive real-time performance for the executive dashboards — greatly impacting their ability to drive strategic decisions.

- Streaming ingest of **up to 12-million+ rows of data per second**.
- Supports **4B+ new rows of data per day**.
- **<100 milliseconds query latency** even with 160K queries/second

## So How Does SingleStoreDB Work?

This ultra-fast, infinitely scalable database has three crucial capabilities you need to support your real-time applications and analytics: 1) streaming data ingestion, 2) low query latencies and 3) support for high concurrency.

## Powering real-time applications with SingleStoreDB





## Streaming Data Ingestion

Data ingestion — measured by the number of rows of data or events your database can ingest per second from diverse data sources — is critical to supporting real-time use cases. For some, this might be as low as 1,000s of rows of data per second, but for other mission-critical use cases such as real-time IoT, the ingestion rates could be as high as millions of rows of data per second.

SingleStore Pipelines, a built-in component of SingleStoreDB, enables high-throughput, parallel streaming ingestion of up to millions of rows per second or GBs/second from diverse external sources.

With Pipelines, you can ingest and transform data-in-motion without the need for third-party tools or middleware. With Pipelines, you can:

- **Enable high-throughput parallel ingestion from distributed sources** such as Apache Kafka, Amazon S3, Azure Blobs or HDFS, with no additional middleware required.
- **Transform and enrich data** with user-defined or Apache Spark transformations for real-time scoring, cleaning and de-duplication.
- **Secure a lock-free architecture** that efficiently processes transactions and updates without locking or blocking concurrent reads.
- **Guarantee message delivery** and eliminate duplicate or incomplete stream data for accurate reporting and analysis.
- **Build your own**, by adding custom connectivity using an extensible plug-in framework.

SingleStore Pipelines also features:

- **Rapid parallel loading:** Load multiple data feeds into a single database using scalable parallel ingestion.
- **Live de-duplication:** Eliminate duplicate records at the time of ingestion for real-time data cleansing.
- **Simplified architecture:** Reduce or eliminate costly middleware tools and processing with direct ingest from message brokers.
- **Exactly once semantics:** Ensure accurate delivery of every message for reporting and analysis of enterprise critical data.
- **Built-in management:** Connect, add transformations and monitor performance using intuitive web UI.

### Need more speed?

Get a Demo and Feel the Power: [How to Load 100 Billion Rows of Data Ultrafast Using SingleStore Pipelines.](#)

## Low Latency for Queries

To deliver the best data experience for real-time applications, you need to be able to meet strict SLAs for low latency on analytical queries serving interactive applications, dashboards, APIs and data products. Because when it comes to queries, speed is king — a return in 100 milliseconds is good, but a return in single-digit milliseconds is ideal.

### Check out our blog:

Get a Demo and Feel the Power: [Shattering the Trillion-Rows-per-Second Barrier with SingleStoreDB.](#)

Unique to SingleStoreDB is our Universal Storage that brings together the best of rowstore and columnstore into the world's only single table type, delivering low-latency performance for both transactions and analytics — without any data movement. This innovative technology serves up the extremely fast table scan performance of a columnstore, while simultaneously supporting highly concurrent point read/writes with performance close to that of a rowstore. SingleStoreDB also scales out horizontally using a distributed cluster architecture, providing high throughput and fast response times for query execution.

SingleStoreDB can store data in blob storage without negatively impacting point read/write query performance like cloud data warehouses. This is why SingleStoreDB is able to deliver 10x-100x the speed of many legacy databases.

Moreover, our unique tiered storage architecture spreads data across three tiers — in-memory (Tier-1), disk (Tier-2) and Cloud Object Storage (Tier-3) — to maximize performance for the data needed most. Hot data is kept in memory, cooler data on local disks and cold data is kept in blob storage. This can be done without impacting query latency. SingleStoreDB has built-in high availability to handle node failures, and can be configured to handle availability zone and region failures. All this coordination happens in the backend without any manual intervention, delivering ultra-fast performance at scale, while optimizing for costs.

Check out the independent [GigaOm benchmark study](#) comparing SingleStoreDB Performance and costs with other leading players.

## High Concurrency

The third key feature you'll need in your architecture to ensure the best user experience possible is high concurrency. You need a database that can handle performance even when you have spikes in users, or queries accessing the application simultaneously. On the very low end, this could be five-to-ten users/queries at a time, but it can grow exponentially into the hundreds, or hundreds of thousands at peak times. For instance, customer-facing apps can experience spikes in usage, and also need to support high concurrencies of thousands of analytical queries per second.

Our query engine delivers low-latency performance — even when you have high concurrency in the number of users and/or queries accessing the application simultaneously. Today, our solution supports customer-facing applications with 40,000+ concurrent users.

## It's Time to Get Real Time.

In today's hyper-competitive, experience-driven business environment, it's never been more important for organizations to build a data infrastructure capable of delivering the speed, scale and immediate insights needed to power real-time decision making. From IoT to fraud analytics, cybersecurity to AI, portfolio management to gaming, modern apps and dashboards are exponentially more powerful with real-time data and insights.

Savvy businesses know that only SingleStoreDB can deliver on this promise. Our cloud-native, massively scalable database provides fast ingest, high concurrency and low latency, enabling you to drive real-time analytics on any data, anywhere, and deliver the actionable insights you need to power responsive experiences for your employees, customers and partners.



### Speed

Ingest up to millions of events per second — while reducing latency query responses to just 10-100 milliseconds.



### Scale

Scale effortlessly to handle fast user or data growth (at petabyte scale) while delivering consistent performance across tens of thousands of concurrent users.



### Simplicity

Simplify data complexity by unifying all your data into one modern cloud database that supports all major data types; runs on-prem as well as in any of the leading clouds; and leverages existing skill sets, such as SQL.

Isn't it time to get real time? With SingleStoreDB, you can.

## Ready to see what SingleStoreDB can do for you?

Visit [www.singlestore.com/cloud-trial/](https://www.singlestore.com/cloud-trial/) to sign up for a free trial of SingleStoreDB Cloud — delivering the full capability of the Real-Time Distributed SQL Database, without the operational overhead and complexity of managing it yourself.