WHITEPAPER

Solution Guide to Real-Time Applications

MEMSQL

MemSQL Solution Guide to Real-Time Applications

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MemSQL for Real-Time Applications

As companies move ahead with digital transformation plans, they continue to focus on building new real-time applications to meet customer and internal needs.

Across industries from finance to media to energy and beyond, architects and business leaders are realizing the benefits of capturing and analyzing data in real-time, and building operational workflows to help them increase revenue, reduce cost, and mitigate risk.

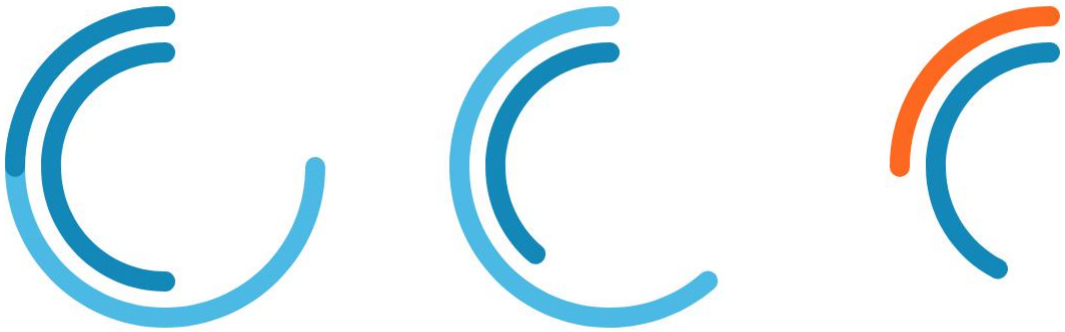
This guide showcases a range of real-time applications across industries, and many applications apply broadly to digital transformation efforts.

Whether you work in finance, media, energy or another industry such as manufacturing, transportation, or retail, this guide will provide a roadmap for charting a real-time applications journey.

MemSQL for Financial Services Solutions

Financial markets move quickly. Access to real-time data gives banks, asset managers, analysts and advisers a leg up. Leading banks and trading firms leverage MemSQL to ingest, query, and serve data to thousands of simultaneous users. Optimized for the following use cases
Optimized for the following use cases

Portfolio Dashboards



Sub-second refresh of dashboards with real-time data, including multiple tables and charts

High-net-worth investors have large portfolios with hundreds to thousands of positions. The performance of MemSQL allows sub-second refresh of a dashboard with real-time data, including multiple tables and charts, even for large portfolios.

This provides first-class service for these clients. This in turn drives up their satisfaction, improves customer retention and facilitates portfolio growth. And that yields improved profits and growth for MemSQL customers.

Low Latency Queries

Interactive query response time through scale out and compilation

Scalable User Concurrency

Scale-out for growing user concurrency with industry-standard hardware

Drop-in Compatibility

Broad tool support through industry-standard SQL and connectivity APIs

Benefits

of portfolio dashboards

Fast Reliable Dashboards

Uninhibited portfolio exploration due to near-instant screen refresh on fast changing data

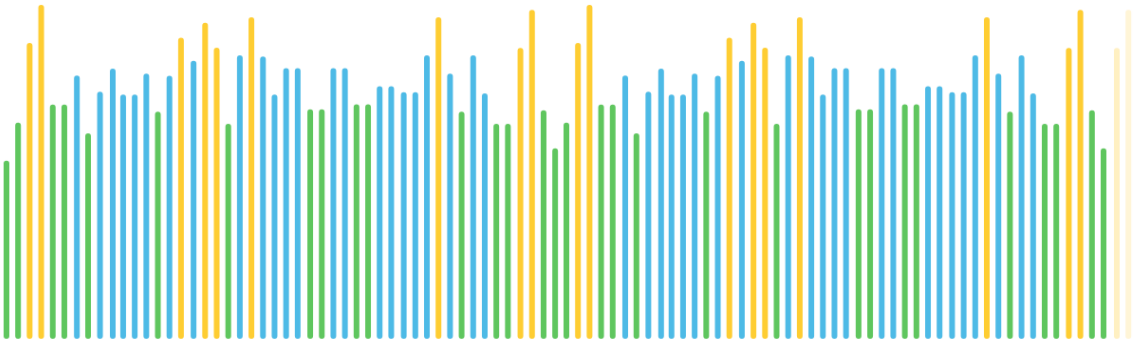
Simplified Scalability

Linear scalability with no code changes to address changing workloads and user access

Real-Time Visibility

Eliminated ETL processing for real-time insight on the latest data positions and transactions

Portfolio Analytics



Investigate investment alternatives seamlessly without troublesome pauses

Portfolio managers work with hedge funds, sovereign wealth funds, endowments, bond management institutions, or investment banks. They manage up to tens of thousands of positions. Their satisfaction with their analytical applications rises as its response time drops to sub-second.

Analytics applications built on MemSQL allow them to investigate investment alternatives seamlessly without troublesome pauses. This allows them to make better investment decisions, giving a return on investment to their institutions that easily justifies the purchase of MemSQL.

Fast SQL

Vectorized and compiled query performance deliver reliable sub-second response

Scale-out Architecture

Deliver performance as user concurrency grows on on industry-standard hardware

Stream Ingestion

Discover insights on fast changing data with real-time ingestion

Benefits

of portfolio analytics

Real-Time Dashboards

Sub-second interactive response allows more thorough analysis to discover and act without delays

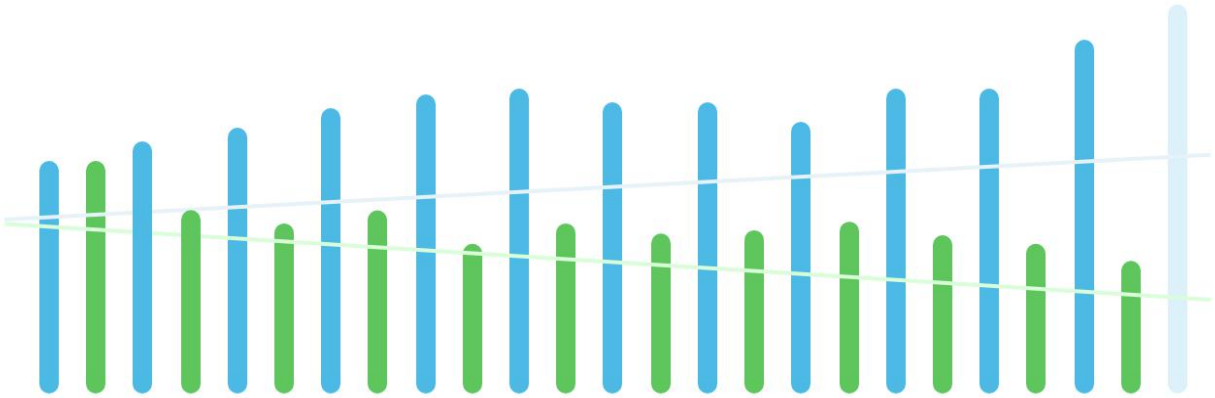
Sophisticated Analytics

Run more analytical scenarios per day across fresh and historical data to uncover new opportunities

Fresh Accurate Insights

Real-time data provides SQL access to the most accurate customer view

Risk Analysis



Use high-speed joins of position risk, index and fund composition, and risk factors to calculate overall risk in real time

Increased regulations after the financial crisis, including the Dodd-Frank Act and Basel III, as well as self-interested vigilance against excessive risk, have caused major financial institutions to carefully study and track their risk profile.

Institutions want to track risk measures for their own portfolios, trading departments, funds they offer, and individual client portfolios, in real time. Customers have built MemSQL solutions to track portfolio risk using high speed joins of position risk, index and fund composition, and risk factors.

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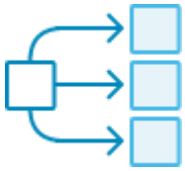


Accurate Risk Calculations

Real-time data ingestion with SQL access ensures calculations are performed on latest events

Scalable SQL

Risk calculations performed in-database with SQL instead of hard-to-maintain application code

Interoperable Architecture

Drop-in compatibility using standard SQL, hardware, and interfaces provides seamless integration

Benefits

of risk analysis

Real-Time Pattern Recognition

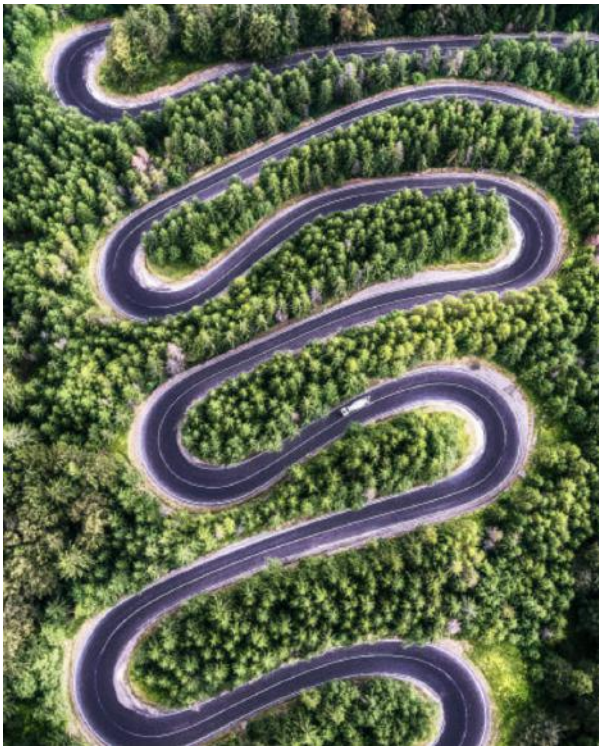
Run pattern recognition queries on fast changing data to minimize compliance risk

Millisecond Query Response

Perform complex analysis with low latency queries for continuous identification of compliance exposure

On-Demand Risk Analysis

Perform on-demand risk analysis without impacting operational database systems for cost effective reporting



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Fraud Prevention

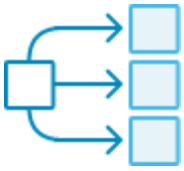
Identify outliers where loan officers and applicants match on characteristics like location or last name

In this era of global finance, vigilance against fraud is more important than ever. Our customers have successfully used MemSQL to build anti-fraud applications.

For example, in lending, extreme measures are required to prevent fraud where a loan officer authorizes credit to a friend or relative who is not a qualified borrower. MemSQL enables this application with fast distributed parallel SQL query capability and spatial data management.

Real-Time Threat Detection

Apply sophisticated threat detection queries on live data to identify threats in real-time



Fast SQL

Fast parallel query processing with vectorization and compilation delivers sub-second response

Scalable Analytics

Fraud prevention logic runs in the database as standard SQL, reducing development time

Benefits

of fraud prevention

Insider Threat Detection

Screen every potential loan interactively to detect and score possible insider fraud

Compliance Optimization

Prevent damaging publicity, fines, and loan defaults with real-time analytics

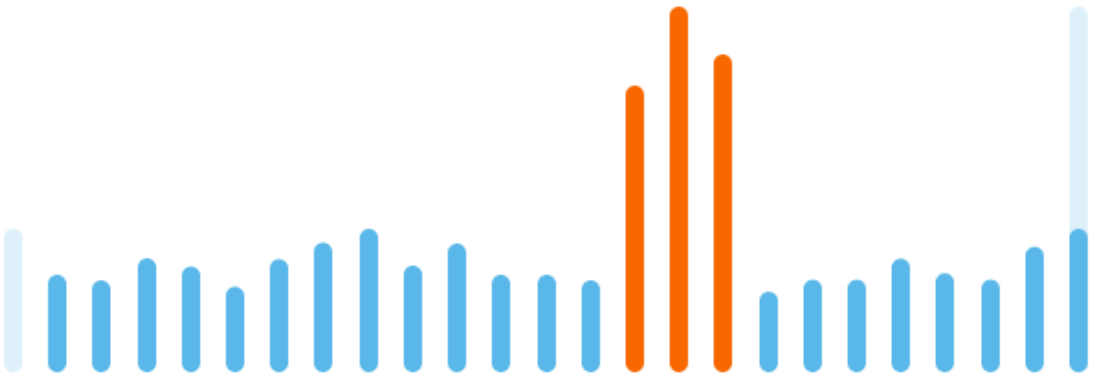
Improved Customer Experience

Approve loan transactions on fresh accurate data to provide a superior customer experience

MemSQL for Media and Communications Solutions

The proliferation of digital media and communications creates opportunities for personalization, improved customer experience, and closed loop reporting. MemSQL collects and analyzes data from millions of devices and users in real time, making it the ideal database for digital media and communications platforms.

Advertising Analytics



In today's data driven world advertisers need to know their advertising performance to respond to anomalies in real-time. Live streaming content and always connected devices force media companies to continuously monitor customer engagement and how that behavior is affected by ads.

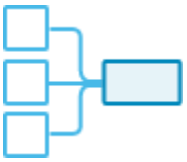
Customers have built MemSQL solutions to serve fast scalable analytics with fine grain query control for deeper insights to optimize and manage thousands of concurrent advertisers.

Sophisticated SQL

Easily build sophisticated queries with ANSI SQL and integrate with custom applications with robust connectivity APIs

Scale to Thousands of End Users

Reliably scale sophisticated analytics to thousands of end users on a highly available operational platform



Single Database System

Simplify complex data architectures by storing and querying live and historical data in a single database system

Benefits

of advertising analytics

Pandora provides real-time analytics for determining effectiveness of campaigns by collecting and analyzing advertising data from user interactions and demographics to determine which ads are most effective.

Real-Time Campaign Analysis

Collect user interactions in real-time to study campaign effectiveness for partner advertisers.

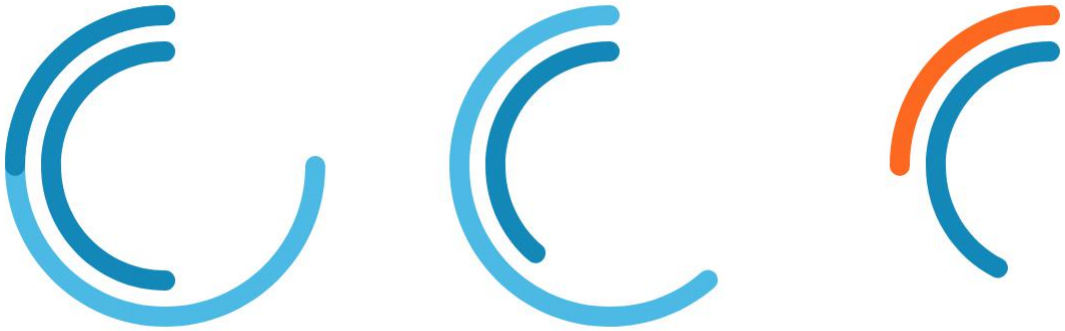
Ad Hoc Analytics

Improve performance of ad hoc analytics on raw data to enable deeper analysis of user interactions.

Single Integrated System

Store historical and live data for long term analysis in a single integrated system.

Media Monitoring and Diagnostics



Sub-second refresh of dashboards with live streaming content

Video streaming requires excellent service delivery to meet customer expectations and remain competitive. Video delivery requires continuous monitoring and maintenance to respond to problems before customers notice. This requires media delivery companies to have real-time diagnostics on the quality of the video stream and the ability to analyze the telemetry to quickly identify and predict problems.

Customers use MemSQL to track real time analytics on video stream data for operational insights on user behavior and media performance. The data enables proactive service response to customers and reduce operational costs.

Single Platform

Support real-time data ingestion while delivering live SQL query simultaneously with a single integrated platform

Industry Standard Hardware

Deliver scalable analytics with distributed architecture on industry standard hardware

Operational 24/7

Highly available platform delivers reliable performance for 24/7 operations

Benefits

of media monitoring and diagnostics

Comcast uses MemSQL to track real time analytics on video player data including frame rate change, buffers, and other media delivery metrics.

Real-Time Dashboards

Build real-time dashboards to monitor every customer action

Sophisticated Analytics

Delight end users with fast responsive drill down in any dimension to quickly explore issues and opportunities

Drop-in Compatibility

Seamlessly integrate with existing data integration and business intelligence technologies

Personalization

Deliver personalized content at the right time to the right segment at scale

Content personalization can improve customer interactions and ultimately drive revenue if the material is accurate and available at the point of engagement. Delivering personalized content

at scale can create a series of challenges for legacy data architectures where accuracy and analytics must work together.

Customers use MemSQL for delivering personalized ads that improves customer engagement and generates new revenue streams. The MemSQL real-time data warehouse delivers accurate results on financial data along with high throughput performance to meet millions of user interactions.

Real-Time Ingest and Query

Support real-time data ingestion while delivering live SQL query simultaneously with a single integrated platform

MySQL Wire Protocol

Interoperate with existing applications and data platforms leveraging the MySQL Wire Protocol and connectivity APIs

Single Integrated Platform

Perform transactions and analytics simultaneously on a single integrated platform

Benefits

of personalization

Tapjoy improved advertising efficiency and performance resulting in improved customer engagement and boosted revenue. The fast performance delivered millisecond response for critical analytics with the assurance of accurate transaction processing.

Ad Optimization

Deliver ad optimization with highly targeted content in real-time

Overlap Analysis

Quickly identify users that fall into multiple market segments

Single Integrated System

Perform transactions and analytics in real-time

MemSQL for Energy Solutions

Optimizing energy or utility services is a data-intensive challenge ranging from upstream discovery to downstream distribution management. Energy companies require fast and flexible data processing infrastructure that enables continuous monitoring, analysis, and response to complex systems that power our modern world.

Predictive Maintenance for IoT

Through the use of complex scoring, track dozens of readings in real-time

Energy companies have geographically dispersed capital-intensive assets that require continuous monitoring and maintenance to maximize profits for optimal delivery. Predicting and avoiding costly maintenance events at scale requires a database platform that cost effectively streams, scores, and responds to data events in real-time. These workflows are integral to modern Internet of Things projects.

One MemSQL customer built a solution that predicts drill bit failure before costly outages occur. Through the use of complex scoring, they can track dozens of readings in real-time to adjust drill operations to maximize performance and availability.

Real-Time Dashboards

Deliver up-to-date dashboards with live data analysis for drill downs and aggregations

Machine Learning Enabled

Run sophisticated algorithms in SQL or use third party ML frameworks such as TensorFlow

Drop-in Compatibility

Leverage existing tools and skills using standard SQL, connectivity, and hardware

Benefits

of predictive maintenance for IoT

Maintain Equipment Uptime

Analyze millions of equipment conditions and events with real-time monitoring

Reduce Operating Costs

Avoid costly outages with optimized equipment operations and planned maintenance

Predict Failures

Prevent high risk operating conditions with real-time predictive scoring

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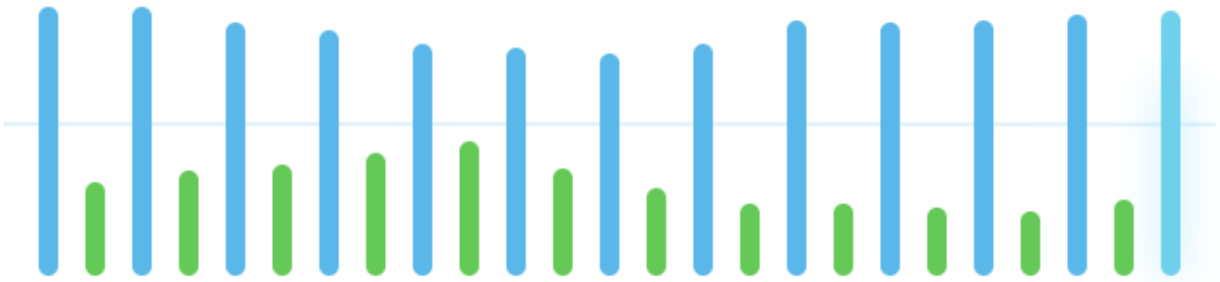
Supply Chain Analytics



Fast ingestion and analytic performance enable supply chain optimizations

Optimizing the energy supply chain yields improved demand forecast accuracy and reduces product delivery lead times. Supply chain analytics improves energy margins and revenue with minimal technology investment.

Customers use MemSQL to drive instant visibility and respond to a variety of supply chain processes including storage management, inventory management, transportation operations, and portfolio optimization. They rely on the fast ingestion and analytic performance for their supply chain optimization programs.

Real-Time Dashboards

Deliver up-to-date dashboards with instant response to drill downs and aggregations

Stream Ingestion

Ingest fast changing data without impacting updates or query performance

Drop-in Compatibility

Leverage existing tools and skills using standard SQL, connectivity, and hardware

Benefits

of supply chain analytics

Improve Forecast Accuracy

Analyze a broad spectrum of historical and live events to predict inventory or production outcomes

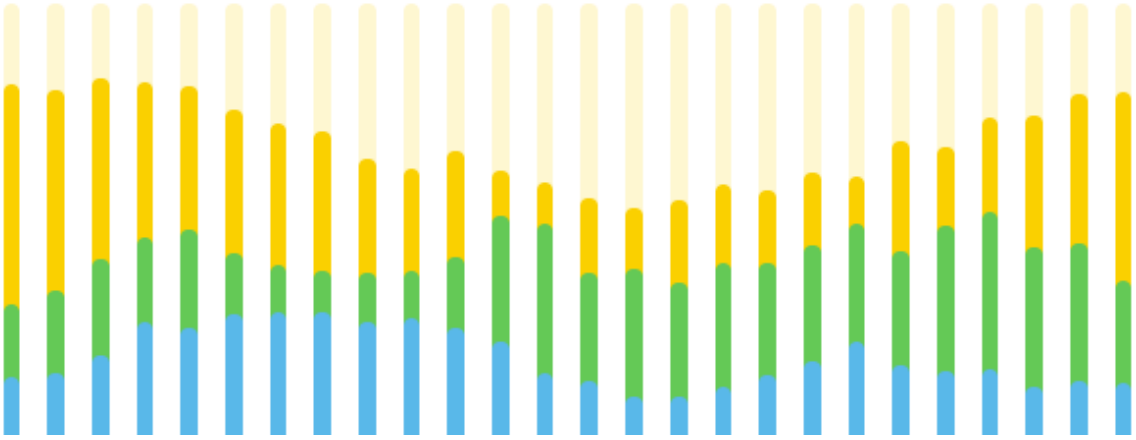
Operational Efficiency

Analyze and respond to oil well inventory, prices, and logistic deliveries to save operational costs

Improve Business Agility

Identify new energy sources or price hedging using machine learning powered applications

Real-Time Grid Management



Ingest and analyze smart grid data to enable real-time visibility

Energy and utility companies manage a diverse set of equipment that is responsible of efficient operations for energy production and delivery. The collection of data can identify costly outages or support new product packaging for innovative revenue programs.

One MemSQL customer ingests and analyzes smart grid data to enable real-time visibility for energy delivery while immediately identifying energy usage patterns to help customers lower power consumption.

Scalable Analytics

Analyze over 1.2 million smart meters and usage trends with real-time performance

Predictive Analytic Stack

Deliver scalable SQL against terabytes of data for data science discovery

Drop-in Compatibility

Seamless integration with existing messaging and database technologies

Benefits

of real-time grid management

Improve Grid Availability

Monitor and locate grid issues in real-time to improve customer satisfaction and reduce service calls

Lower Operating Costs

Predict grid operating issues to minimize costly outages and reduce operating costs

Empower Customers

Deliver real-time visibility of energy consumption to help lower customer energy usage

Get Started With Your Real-Time Applications Today

To learn more and get started with your real-time journey, drop us a line at info@memsql.com or visit www.memsql.com.

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