Modernizing the Portfolio Management Experience to Drive Competitive Advantage

3x

cost reduction with SingleStore over the legacy Oracle solution

5

years of data history stored in SingleStore compared to only three years with Oracle

"... the digital transformation of banks creates new sources of revenue, supports new enterprise operating models, and delivers digital products and services"

- 2019 CIO Agenda: Banking and Investment Services Industry Insights

Customers want smarter and dynamic portfolio management services that deliver optimal returns while reducing their risk exposure. Portfolio managers want guided insights to avoid sudden or dramatic rebalancing of funds that can drive up costs and reduce customer confidence. That's why organizations – like the leading North American financial services company highlighted in this case study – are using advanced analytics and machine learning to use thousands of factors to automatically assess risk and optimize portfolio performance. This requires a high-performance data infrastructure that can accurately analyze and recommend decisions for portfolio managers when it matters most – in real time.

Business Goals

A leading North American financial services company struggled to meet the performance requirements of its analytics that powered portfolio optimization and risk mitigation. Its existing legacy infrastructure was quickly becoming too expensive, overly complex, and slow to support growing analytic demands. This included rising user counts, as more employees sought to perform pre-trade, risk modeling, and portfolio rebalancing analyses in real time.

As the firm looked to modernize its data pipelines and move to more continuous feeds, its reliance on extract, transform, load (ETL) became burdensome. Ultimately, the overall budget and lagging support services for the predominantly Oracle-based solution resulted in the company investigating new database alternatives.

The new database to power the portfolio management solution needed to:

- Support **low-latency queries** at **high concurrency**
- Work seamlessly with the existing analytics tools and skills, requiring support for standard **ANSI SQL** in any new solution
- Easily integrate with Apache Kafka for **streaming data ingestion**

SingleStore

Leading Financial Services Organization Uses Data & Analytics to Transform Portfolio Risk Analytics and Drive Better Customer Experience

Technology Requirements

The firm wanted to leverage in-memory technologies to meet its low-latency requirements. It needed a cost-effective tiered storage model incorporating disk and effective data compression to support periodic ad hoc response times commonly required by data scientists and data analysts developing new models and scoring algorithms.

It also was looking for a solution that could run on premises and that would be more cost effective than its current investment in Oracle.

Under its existing environment, the firm needed to bring in data from various sources, including legacy databases, third-party external data, and customer behavioral data, and all of it had to go through the batch ETL process before it could be loaded into a traditional data warehouse. Different business users and analysts, such as teams leveraging data tools like Tableau, Excel, and SAS to do data exploration and data science, accessed data in the warehouse when needed.

But because ETL was done in batch hourly and nightly, it became a bottleneck for data ingestion. Additionally, the system was offline whenever it would ingest large amounts of data.

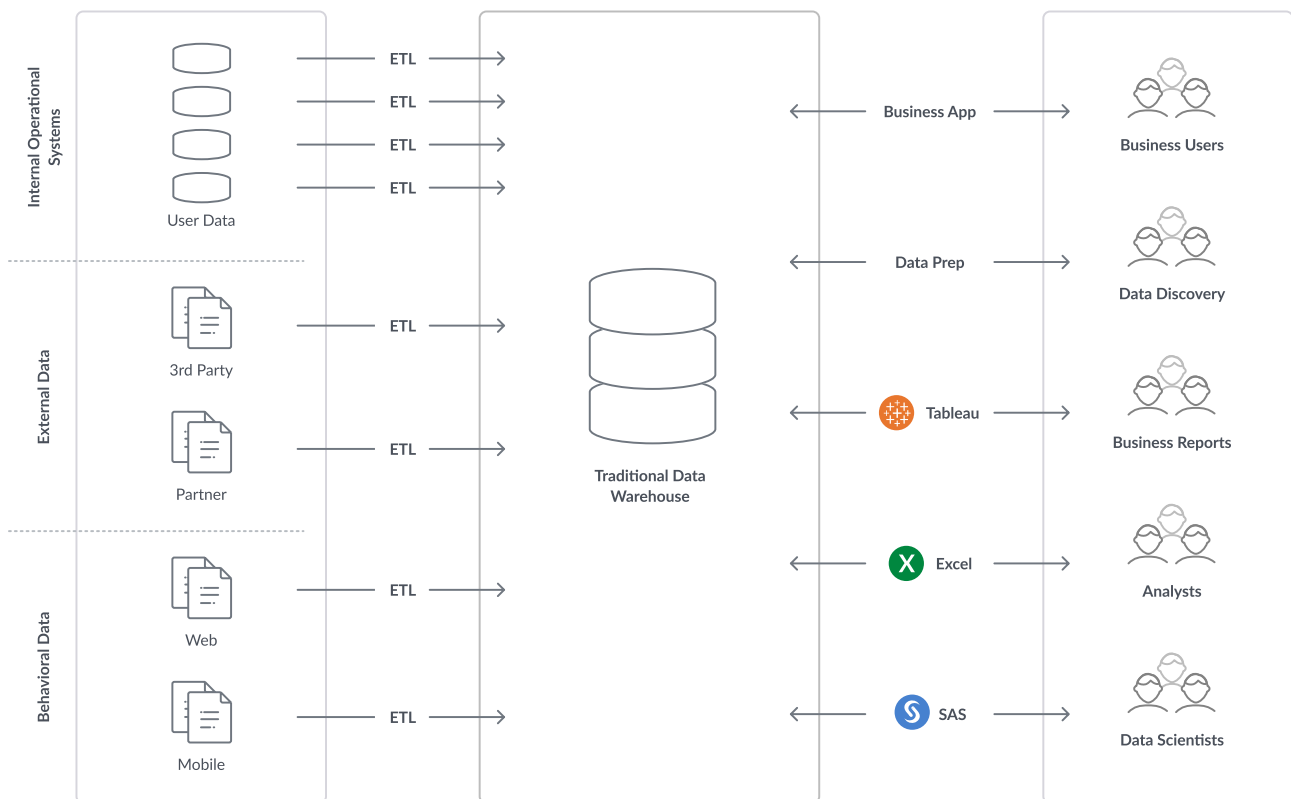See Figure A for the "before" architecture.

Fig A - "Before" Architecture: Original batch-oriented architecture with Oracle

SingleStore

## Why SingleStore? The Unified Database for Fast Analytics

The financial services institution selected SingleStore for its robust performance and scalability, familiar relational SQL, and low-cost licensing structure. The firm quickly integrated SingleStore with its existing data tools and queries due to its support of standard **ANSI SQL**. Plus, it was able to replace legacy ETL pipelines with Apache Kafka for **real-time streaming ingestion.**

Using the Lambda architecture, the company now routes data into two SingleStore instances, one a data warehouse and the other a data science sandbox. Additionally, data flows into a Hadoop data lake for long-term storage. Key data is pulled from the SingleStore data science sandbox and the Hadoop data lake into a Spark cluster, used to train with the newest market data and do continuous evolution of ML algorithms.

Now, the organization can use new queries to quickly quantify investment risk analysis based on live market events to help guide the best outcomes for its customers. The modernized portfolio management service uses high-range data models that leverage **pattern mining** in real-time to quickly identify hidden risk factors.

The advanced analytic and machine learning queries now possible with SingleStore met the company's stringent real-time response needs to support analysis on more granular data sets, offering the firm more confidence in its portfolio recommendations. The distributed database also provided an easier approach to managing **user concurrency growth** without incurring outages or downtime. The firm is also now able to deliver a robust, scalable service powered by SingleStore that provides the highest database performance and parallel stream ingestion.

The architecture in Figure B highlights the new solution.
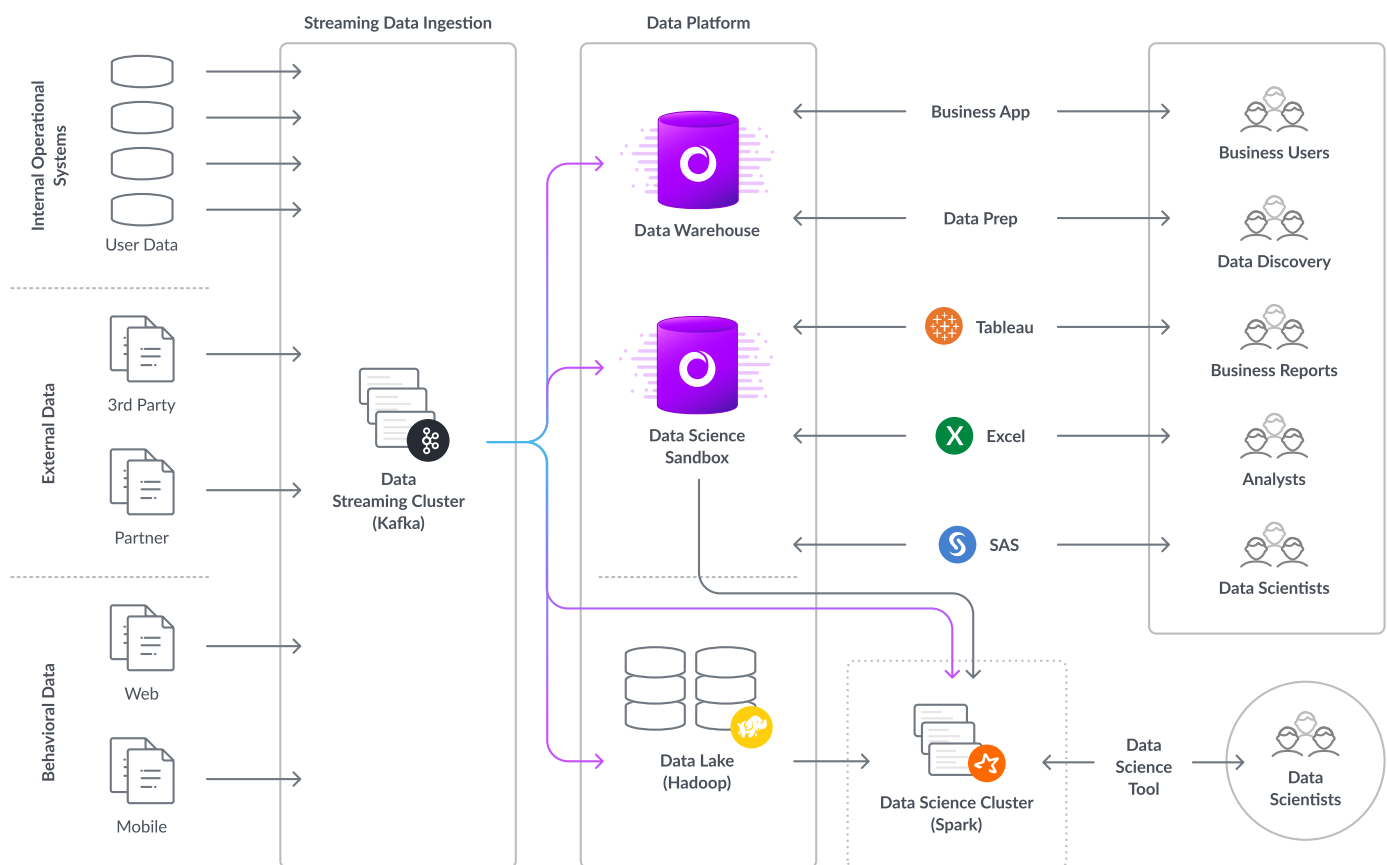
Architecture with SingleStore: Modernized real-time portfolio management

Business Outcomes

Dramatic improvement in performance

The team immediately experienced a dramatic improvement in performance over its predominantly Oracle-based solution, including passing demanding concurrency tests and more advanced queries that historically couldn't even finish with the previous database.

The team began work building new machine learning-driven stress tests that can be run during market hours, resulting in **real-time response** to the latest portfolio positions.

3x cost reduction

SingleStore enabled a **3x** cost reduction due to efficient hardware utilization over Oracle and gained the ability to use compressed disk and less memory for the same queries. Additionally, SingleStore's superior query system reduced the number of database administrators (DBAs) required to manage the system, which also fuels cost savings.

Additional risk management capabilities

The new distributed database is able to continuously ingest, analyze, and guide fund managers and their customers to recommended actions, adapting to changes in market events or from the results predicted by dozens of what-if scenarios. SingleStore provides additional risk management capabilities, with added speed and scale to differentiate its portfolio offering.

SingleStore helps half of the top 10 financial service institutions in North America and a number of fast-growing FinTechs around the globe accelerate the performance of their data infrastructure to enable support real-time decision making and deliver exceptional customer experiences.

With a cloud-native, distributed data architecture, SingleStore offers a **unified database for fast analytics** powering applications that require fast data ingest, high performance queries, and elastic scaling. Its familiar relational SQL interface also enables quick adoption by all teams across the entire enterprise.

Among a number of mission critical use cases, financial service customers use SingleStore to improve the response and accuracy of fraud detection services, reduce risk, enable algorithmic trading, and to accelerate the performance of advanced portfolio analytics and interactive dashboards.

Financial service organizations choose SingleStore to move past the limitations of their legacy data architectures and the performance issues caused by batch ingestion, slow queries and poor scalability. With SingleStore, financial services institutions of any size can deliver real-time decisions for their internal and customer-facing applications with a cost-effective, simplified data architecture.

With **SingleStore Managed Service**, the fully-managed, on-demand cloud database service you can get started in just a few clicks— on any cloud of your choice. **Test drive now.**

Check out **singlestore.com** for more details.

SingleStore