

Case Study: Streaming Data Integration Powers Global Airline's Flight Operations

Leading Airline Uses Striim for Real-Time, Single View of Operations and Customers

Summary

Streaming data integration powers the global airline's data infrastructure for mission-critical flight operations. The airline can quickly detect events that may impact flight and crew schedules, and regularly optimizes these schedules based on real-time business and weather events. By enabling unified, real-time visibility, and operational insights in seconds, Striim's solution allows time-sensitive decisions to reduce delays and get passengers and cargo to their destinations with the industry's highest customer satisfaction.

Business Needs

The global airline continuously invests in achieving operational excellence and exceptional customer service. With this goal in mind, the company decided to modernize its data infrastructure for flight operations to gain real-time intelligence and make highly time-sensitive decisions. To create a unified view into all global operations and customers, the airline needed a new next-generation, low-latency data integration solution, and a modern data lake solution. Other integration requirements included continuous stream processing, ingestion from heterogeneous data sources, and the ability to deliver to contemporary data targets, such as distributed messaging systems, the data lake, and public cloud services.

Technology Solution Architecture

Striim continuously loads the data lake with data from critical transactional databases. Striim was chosen to rapidly build secure, scalable, and reliable real-time data pipelines. The data sources include flight operations,

Leading Global Airline

Industry:

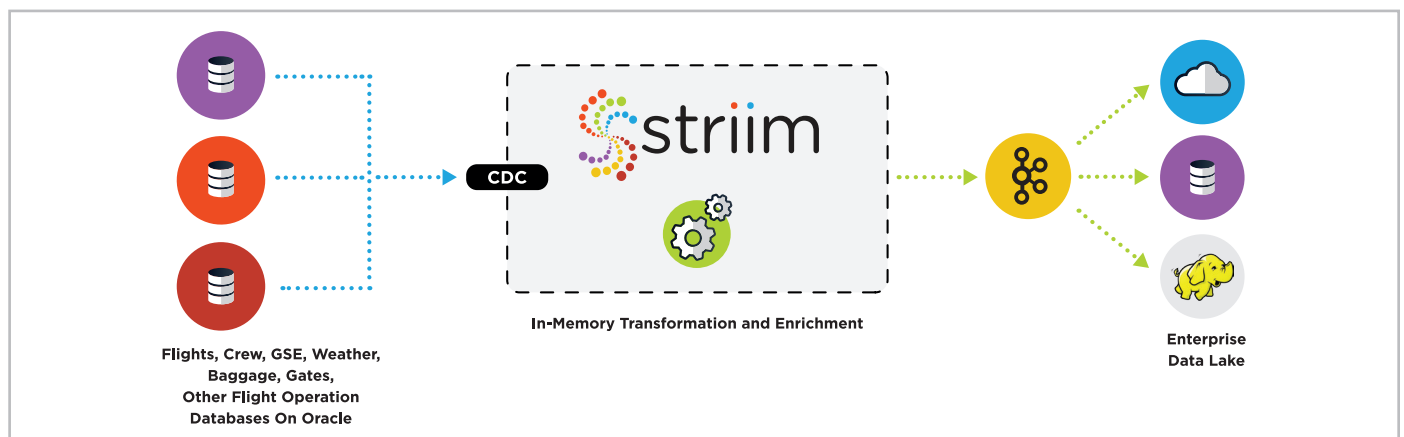
Transportation

Region:

Global

About:

A leading provider of scheduled air transportation for passengers and cargo



Striim's streaming data integration provides real-time data for operational dashboards.

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crew assignment, passenger booking, ground service equipment (including catering, de-icing, and maintenance), weather, gates, baggage, and other operational databases. Striim's ability to use low-impact, log-based change data capture prevents performance degradation in production databases.

After Striim ingests real-time operational data from the airline's Oracle databases, it performs in-memory transformations for data-in-motion. With its SQL-based stream processing capabilities, Striim reduces end-to-end data latency and delivers the data in a consumable format to the Kafka messaging system in sub-seconds. The airline's existing tools then move the real-time data from Kafka to a NoSQL database, HDFS, and its enterprise data warehouse. The data lake solution powers live operational dashboards using data with less than two minutes latency and supports decision making for mission-critical flight operations across different airports.

Business Transformation

Using Striim for its data lake, the airline now has a single, real-time view into its flight operations. The flight operations team uses multiple, live KPI dashboards to track different operational stations' progress status with data latency between seconds to less than two minutes.

De-icing Station KPI Dashboards

One of the critical KPI dashboards is for the de-icing process. For cities with rare icing or snow incidents, the de-icing step can take a longer time than allocated, and lead to flight delays. Especially for these locations, the dashboards provide real-time updates on the de-icing process status, enabling the team to proactively handle possible flight departure delays. To improve on-time departures, Flight Operations teams can make immediate tactical decisions such as speeding the de-icing process by requesting another equipment, assigning a different aircraft, and reassigning passengers to other flights and gates.

To be able to make timely, proactive decisions that minimize costs due to delays and missed flights, the team needs reliable, up-to-date data. Even a five-minute delay in getting data to KPI dashboards can negatively impact their ability to assess and influence the ongoing operations accurately. The airline's KPI dashboards provide up-to-the-minute data for all critical operational stations' throughput and status. Timely decision making for crew scheduling also allows the airlines to comply with government regulations and crew union rules for pilots' and flight attendant's total duty periods and minimizes incidents that lead to paying fines.

Flight and Irregular Operation Simulations

In addition to tracking and responding to real-time events, the Flight Operations team uses the data lake for replaying past events to improve future actions and decisions. Using Striim's CDC feature to ingest granular operational data from previous, unexpected events allows the airline to go back and analyze past decisions in detail, and create operational models for better handling of operational emergencies and irregularities.