Flow Disrupts Payment Processing Industry with Confluent at Its Core

At Flow Networks, every payment and every customer is unique, and every transaction is a chance to connect the dots across stakeholders to improve personalization and engagement. At only two years of age and with founders from Visa and PayPal, the company has already managed to start disrupting the payment processing platform space with its innovative approach to payment data and how it’s managed.

As Flow began to build its unique B2B2C payment processing platform, it realized it needed a powerful, event-driven architectural foundation to manage fast streaming data and contextualize data from various sources to empower a richer, more personalized customer experience. For example, to provide real-time recommendations to merchants and customers alike for the next best action following a transaction. Flow chose Confluent Cloud on AWS as the basis for this platform.

"Confluent sits at the very core of our entire platform and modern payments business, serving as the underlying data mesh for everything we do today and anything we may want to do in the future. Operating around real-time, trusted data streams fueled by the entire business means every team is equipped with the data they need to build rich, personalized experiences for our customers while maintaining the flexibility to easily change or evolve solutions as our business grows."

Klas Hesselman, Co-Founder, Flow Networks

The Challenge: Creating a data prism

Flow is building a unique platform sitting at the intersection of fintech and retail tech, one that helps banks and merchants worldwide engage with their customers. The company is creating experiences tailored to the consumer and the payment context.

"Our central value proposition is that we’re offering a real-time streaming platform for enriching data to drive a very unique contextual experience for every customer when they’re making a payment," said Flow Networks co-founder Klas Hesselman. "So if you want it to be a real-time data platform around payments, you need it to be scalable, you need to have resilience, and you need it to be a global proposition from day one."
Hesselman likened Flow’s payments data to a ray of sunlight shining through a prism: Confluent’s event-driven data architecture helps them turn that single, one-dimensional ray of light into a rainbow containing valuable contextual information about the various parties involved in the payment, from the consumer to the merchant to the payment processing applications themselves.

It takes about one-thousandth of a second for data to get through Flow’s pipeline, but during that time hundreds of things need to happen to enrich that data so that Flow, and its customers, can build deeper and more meaningful relationships with their customers during the payment moment to drive engagement and retention.

“Our enemy is cost and complexity,” Hesselman said. “The faster and simpler we can get the data in and out, the better the final product will be and the better the customer experience will be.”

To be able to flexibly grow its data pipeline and perform at high speeds, Flow needed a future-proof solution that could form the backbone of its entire IT architecture, one that would allow them to quickly and efficiently enrich payment data.

### Technical Solution: Event-driven architecture to deliver unique customer experiences

The need for speed and for an event-driven architecture led Flow to Confluent, which is built on Apache Kafka®, allowing Flow to completely decouple their microservices.

Specifically, Flow required:

- **Modularity**, so that the complex domain can be decomposed into smaller parts, each highly cohesive and serving only one purpose. Connecting them back will be through eventing with Kafka.

- **Scalability/flexibility**, so that the platform is able to add more capabilities as well as serve more clients and traffic in the future without placing any impact on the existing ones.

- **Repeatability**, so that every processing path on the chain can be retried or replayed in case of failures, which can happen at many places in a distributed system, such as the database, network, computing, etc.

Hesselman and his team were already familiar with event streaming from a previous experience of adopting a combination of event-driven architecture (with Kafka) and a change-data-capture (CDC) approach for decomposing, then connecting, different pieces of a system and keeping them synchronized on important data.

Before moving forward with this project, the team considered other technology options, such as Apache Pulsar. However, due to the maturity of Kafka, the team’s existing familiarity with it, and Confluent’s committer-driven expertise, the decision was very easy.

Flow uses Confluent as the backbone of their system for inter-microservices communication among MongoDB, AWS S3, and Databricks. The most popular use case is a microservice producing an event into Kafka to tell the system what happened, then the rest of the system is able to subscribe to the event and react accordingly.

The second most common use case is to use Kafka Connect and open source Debezium connectors to keep microservice configurations in sync. Flow’s data pipeline is also a consumer of business events that in turn serve as the input for building data analytics and, more recently, machine learning features.
Business Results: A new data foundation

Data pipeline speed, agility, and scalability
“What we’ve seen is that speed matters immensely when it comes to engagement,” Hesselman said. “To give you an example, when we worked on one of the world’s largest sporting events in 2021, we aggressively worked to reduce latency to meet customers’ expectations. When the name of the game is engagement, you really have to be as close to real time as possible or customer attention moves elsewhere.”

Enhanced data privacy
“We handle very sensitive data from banks, so obviously data privacy is hugely important for us,” Hesselman said. “What Confluent provides, apart from a single source of truth for all our data, is the ability to protect data privacy using RBAC and audit logs on streams that contain sensitive data without losing any analytical horsepower.”

Architectural foundation for new platform
“Confluent is essentially the drive train of our entire platform,” Hesselman said. “It’s the place all our data flows through and it’s what makes our customer engagement platform run and run well. It’s allowed us to future-proof our solution.”

The Future: Setting data in motion
Moving forward, Flow Networks plans to increasingly leverage Confluent and ksqlDB for real-time processing of data streams to improve customer engagement and take full advantage of data in motion.

Ultimately, it comes down to creating that data prism and being able to refract the light as much as possible.

“What we want to ultimately do is take this small white light and transform it into a colorful experience with a thousand colors,” Hesselman said. “That’s what gets us really excited about Confluent and its capabilities. We don’t know what the colors are yet, but we are starting to get an inkling, and we’re really just getting started.”

Learn More About Flow Networks
https://flownetworks.io/