Cockroach Labs

CASE STUDY

Why (and how) **SumUp** migrated their global payments platform to CockroachDB

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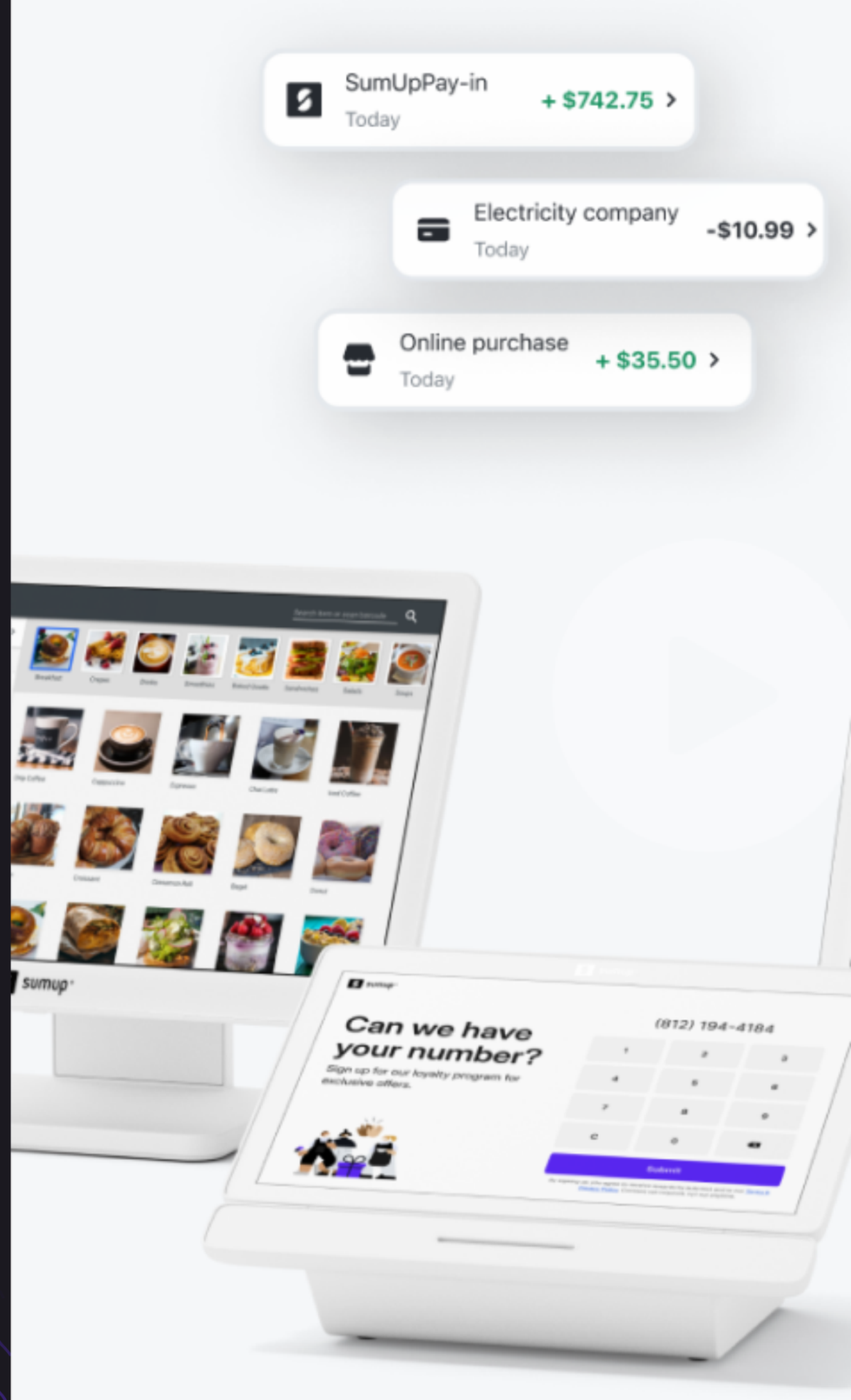

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Why (and how) SumUp migrated their global payments platform to CockroachDB

INDUSTRY:
Fintech

CHALLENGES:
Scale, performance, availability challenges with legacy systems.

SOLUTION:
A globally available, strictly consistent, and always-on platform built on CockroachDB

About SumUp

Headquartered in London, SumUp is the leading mobile point-of-sale (POS) company in Europe who is on a mission to create a world where anyone can build a thriving business. The global fintech was founded in 2012 and is currently a trusted partner for 4M+ merchants across 36 markets – but they aren't stopping there.

SumUp's platform is uniquely suited to give business owners a comprehensive toolkit to run their entire operations. They offer an extensive product suite including card-present payment services, a bank-like business account with a debit card, remote payments, invoicing, point-of-sale software and registers, loyalty and rewards solutions, online stores, and a customer wallet.

A few years ago, SumUp was struggling to scale its legacy relational database to keep up with the company's momentum and evolving product offerings. They decided to migrate their core payments platform to CockroachDB, enabling them to architect a system on a reliable foundation for the foreseeable future.

Watch : Why (and how) SumUp migrated their global payments platform to CockroachDB

1B+

TRANSACTIONS PER YEAR

10K

PAYMENTS/MINUTE AT PEAK TRAFFIC

0

DATA LOSS

Costly legacy challenges

SumUp's original infrastructure was built on AWS RDS for PostgreSQL. As the business grew, they started to face several challenges associated with scale, performance, availability, and maintenance.

First, they were vertically scaling PostgreSQL to the point where there was nowhere else to go. Manual sharding is a well-known workaround, but causes a lot of operational overhead. Additionally, RDS for PostgreSQL has a single primary write architecture with one writer and many readers. This was becoming a performance bottleneck and was a single point of failure which put them at risk for outages.

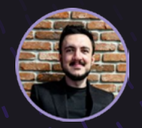
Not only were they concerned about unplanned downtown disruptions, but they were also regularly taking the database offline for routine maintenance, such as DB version upgrades. This type of planned downtime was no longer acceptable to SumUp, as they're across multiple markets, continents and time zones. There's no time for a scheduled downtime.

Overall, operational complexity was becoming a problem at scale and they wanted a distributed system that would help solve some of these challenges out of the box. At a more granular level, these were their requirements for a new solution:

- Ability to horizontally scale out to multiple regions
- Native change data capture (CDC) with first-class support for Debezium
- Online schema changes
- Multi-node write support to scale traffic and maintain resilience
- ACID guarantees for correctness
- Standard SQL support for developer efficiency
- PCI-DSS compliant

They started to evaluate several database options including CockroachDB, Yugabyte, ScyllaDB, and MongoDB. When they did a side-by-side feature comparison, CockroachDB stood out in a few particular areas: strict serializability, truly global multi-region writes, full online schema changes support, and native CDC.

"We were looking for a strictly serializable consistent database that was PCI-DSS compliant and would allow us to scale horizontally across multiple regions. We also wanted to bring the latest engineering practices to our team. CockroachDB was the best database solution that met all of our requirements."



Anton Antonov
Engineering Manager SumUp

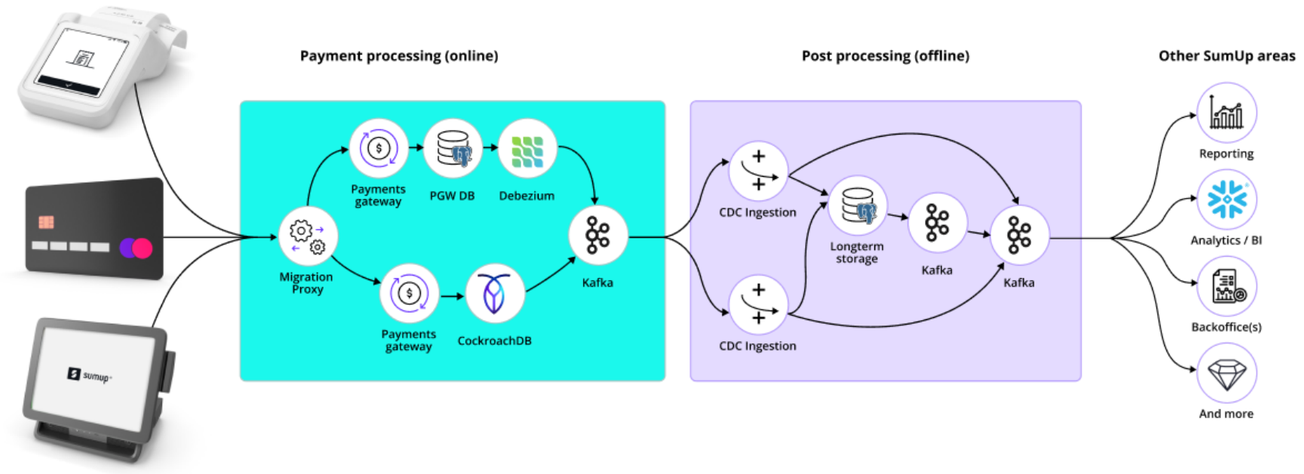
Zero downtime migration strategy

After selecting CockroachDB as their new database, SumUp organized a plan to move workloads from their legacy PostgreSQL setup to CockroachDB, while keeping the system online and data consistent. This is a high-level overview of the migration, but to hear the full story from SumUp's Engineering Manager, Anton Antonov, click here.

During the process, all requests went through a "migration proxy" which was routed to either the old database (PostgreSQL) or new database (CockroachDB) based on the Universally Unique Identifier's (UUID) versions. Debezium read changes from PostgreSQL and feed them into Kafka ensuring that the post-processing analytics were completed and consistent during the migration. Both the old database and CockroachDB were fed the same Kafka stream to guarantee there was no breakage for customers downstream in areas like analytics, reporting, and back office tools.

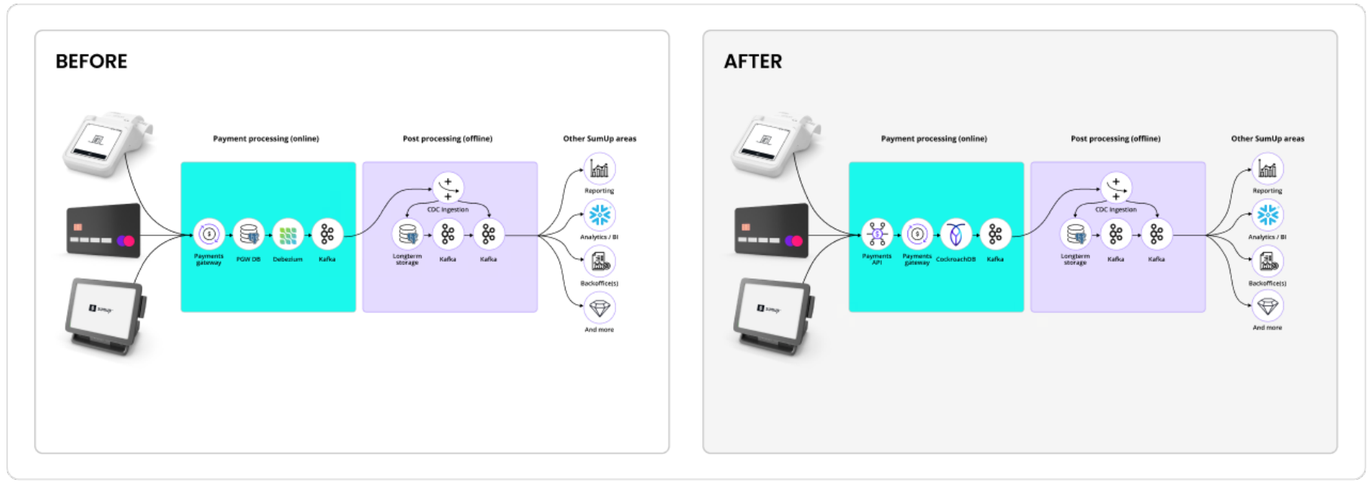
The dual write setup allowed them to validate and backfill while gradually shifting the load. Ultimately the SumUp team completed the migration with zero downtime, zero data loss, and zero rollback horror story. The diagram below illustrates what this process looked like behind the scenes.

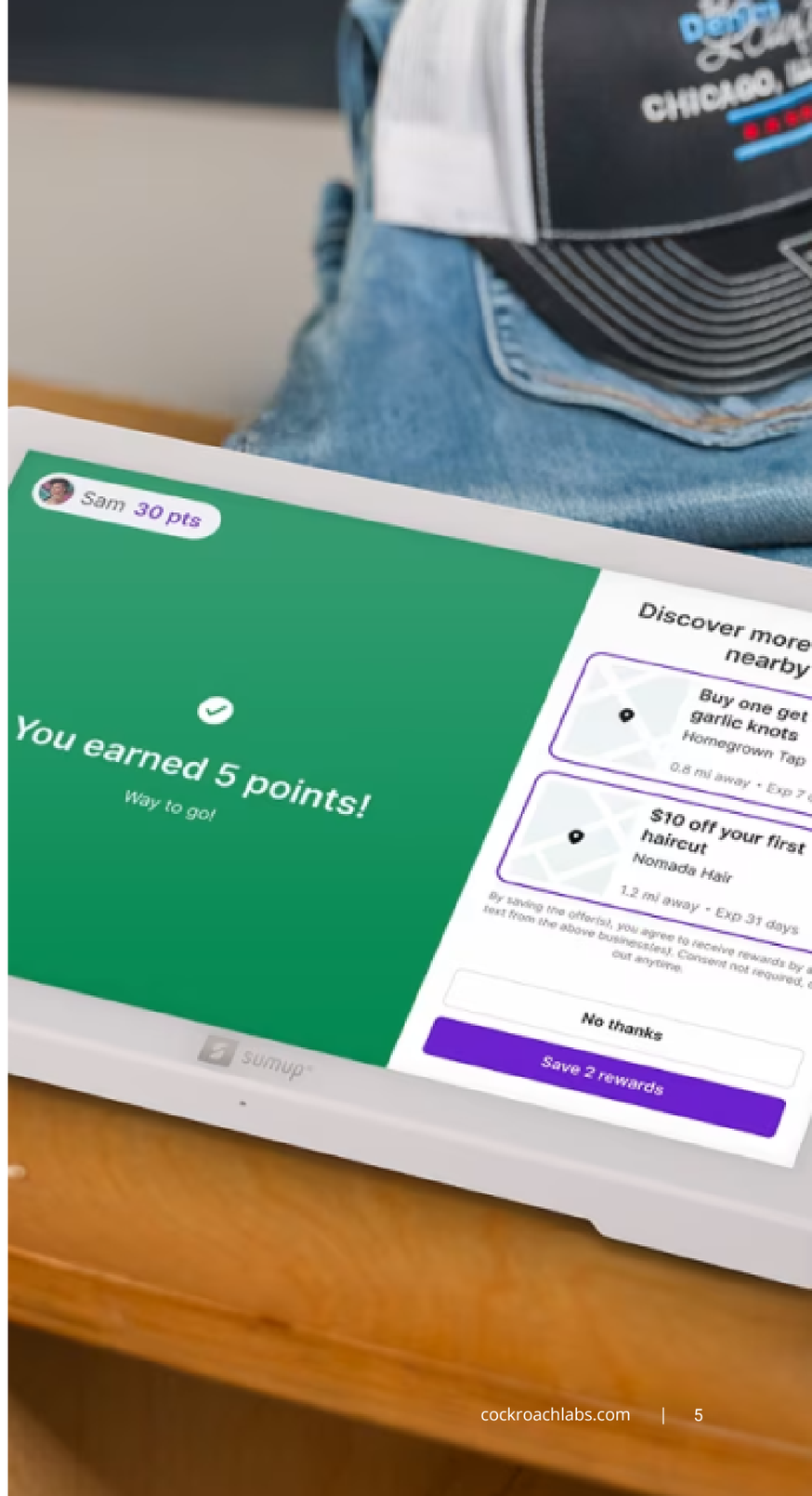
During Migration:



Following the migration, all online payment processing routes to CockroachDB (see diagram below). The SumUp team transformed migration components to Payments API which is an API gateway and aggregator. This will enable them to break down the payments gateway into smaller microservices when the time comes in the future.

Kafka continues to serve as the backbone for decoupled communications, and CockroachDB's built-in change data capture (CDC) feeds the long-term storage for future replays and audits. With CockroachDB, SumUp was able to build a globally available, strictly consistent, observable, and always compliant platform built for long-term resilience and growth.



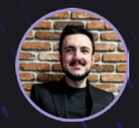


Embrace the cockroach way

When switching to a new technology, there's always some lessons to be learned along the way. Anton remarked that they needed to think differently about how a distributed database would work. He recommended embracing Cockroach Labs documentation, and to make sure you are following the best practices.

When it comes to their new setup, Anton said it's smart to "treat CockroachDB as a first class citizen" and to integrate it into your observability stack. This will help you debug issues faster and always have insight into what is going on behind the scenes. He also recommends automating as much as possible to alleviate unnecessary operations for your team.

"Our shift to CockroachDB is not just a database choice, it's a choice for a new system that can solve challenges at global scale. Problems that used to be handled at the application layer are now handled at the storage layer. It totally simplifies development and allows us to build truly global payment services across multiple regions."



Anton Antonov

Engineering Manager SumUp

What’s next

In 2024, SumUp reported that they processed over 1B transactions in a year and had around 10K payments per minute during peak periods. Over the next few years, the company plans to expand its presence around the globe.

While tackling global expansion, the engineering team will also continue to work on improving the observability, scalability and resiliency of their systems. Anton is excited to share his knowledge of CockroachDB with other engineering teams so they can take advantage of its distributed capabilities that are well suited to support fintech use cases.

To learn more about SumUp’s offerings, visit their website: www.sumup.com.

Ready to get started?

Start a free trial of CockroachDB or contact sales to learn more.

Get started →

Contact us →