Cockroach Labs

[CASE STUDY]

Route
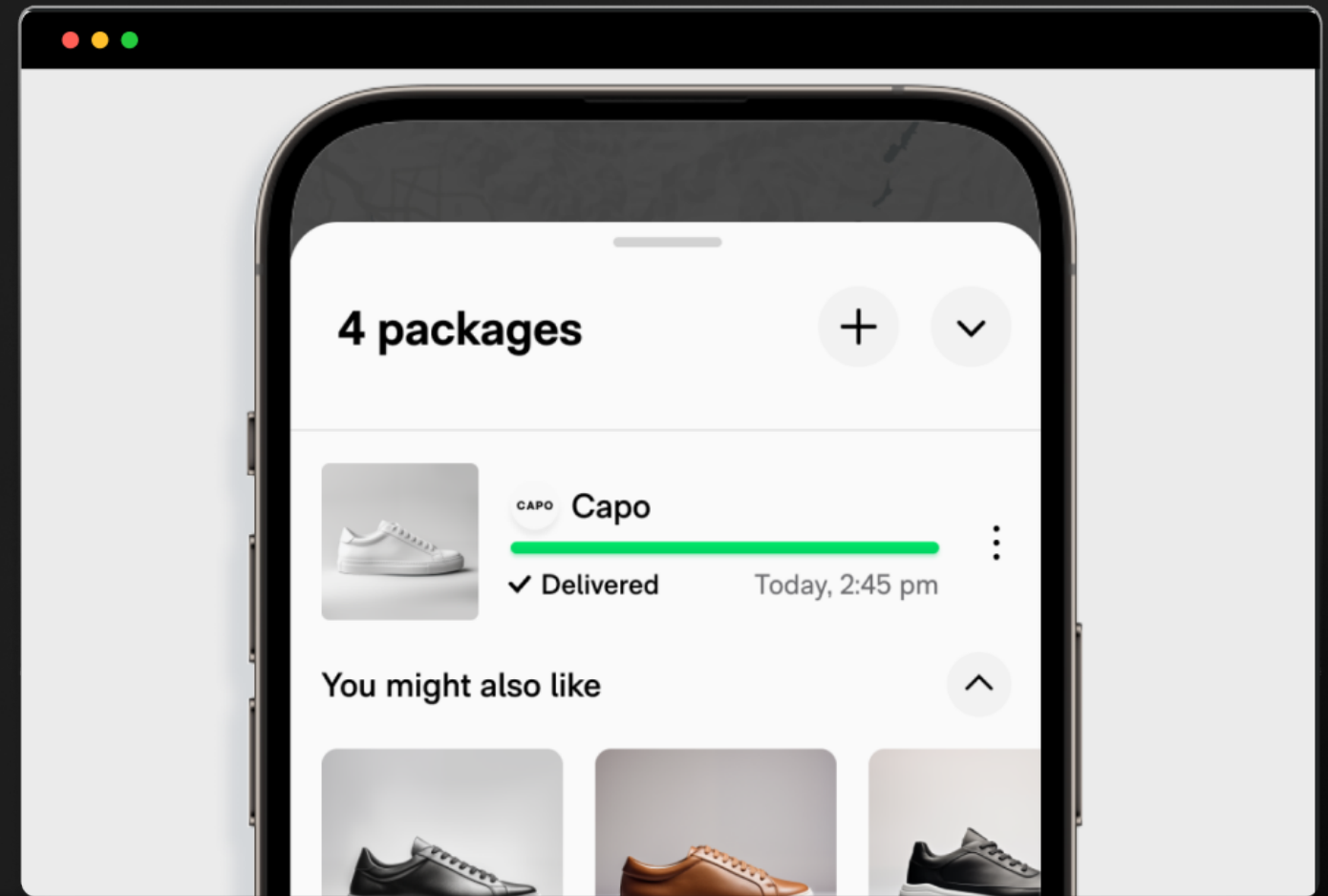
How Route powers always-on data for 1+ billion orders with CockroachDB

INDUSTRY:
Software development (package tracking and shipping protection)

CHALLENGES:
Scaling order, shipment, and tracking data into the billions without failing.

SOLUTION:
A highly available, scalable, order management platform built on CockroachDB.

ROUTE

How Route powers always-on data for 1+ billion orders with CockroachDB

"CockroachDB gives you another option that's not strictly SQL and not strictly NoSQL. It's kind of this next-generation database that helps us solve a lot of challenges as we become more dependent on data and need to scale out further and further."

– Bryan Call

Senior Principal Engineer, Route

About Route

If you've ever placed an order with Alice + Olivia, BlendJet, Cult Gaia, Tom Ford, Daily Drills, LoveShackFancy, Solo Stove, or Wellbel to name a few – Route was there to protect your package.

Since launching in 2019, Route has built an eCommerce network of more than 13,000 brands and millions of active app users. The company is a leader in the post-purchase experience, protecting their brands and customers with licensed shipping insurance, fast issue resolution, package tracking, carbon-neutral shipping, and more.

Route's business is built on delivering an exceptional experience to its app users – and also to its merchants who entrust them with their customers. To increase customer satisfaction and revenue, Route uses CockroachDB to power always-on data for 1 billion orders and counting.

Watch ▶: **Why Route chose CockroachDB for their highly available, scalable, order management platform ▸**

Modernizing a monolith

Five years ago, Route's CTO had a vision: to break up their monolithic database that was based on PostgreSQL. Given the business momentum they had seen so far, he knew they had to scale order, shipment, and tracking data -- and they didn't want to have to manually shard PostgreSQL. They also sought a solution that could consolidate their data all in one place.

Bryan Call, Senior Principal Engineer at Route, understood the reasoning behind the CTO's decision. "A big challenge I've had with databases is scaling," Bryan remarks. "You end up really having to i
ncrease your application layer complexity to be able to scale your database. Another challenge with databases is that they are always such critical parts of our system, and they are generally a single point of failure."

Route needed to be able to scale out while maintaining high availability, while also delivering low latency answers to users' questions. Bryan says that as consumers, we expect everything to be instantaneous and we aren't very tolerant of loading icons – in the eCommerce space, it's very easy to lose a customer during an online purchase if the process doesn't go well.

Given all that they needed to accomplish, Route's requirements for a new database included the ability to achieve:

- ✓ Single view of all data

- ✓ Horizontal scale without sharding

- ✓ Always-on availability

- ✓ Performance at scale

When searching for a solution that met all of the above key criteria, they landed on CockroachDB, a cloud-native distributed SQL database.

Millions
OF ACTIVE APP USERS

1+ billion
ORDERS

52TB
OF STORAGE

Creating a centralized data store

When getting started with CockroachDB, it was top of mind for Route to ensure that everything about the customer's order and their actions ends up in one place. This meant that they needed to consolidate the data about what a customer ordered, where it's going, and when it is going to get there.

Route's platform collects order and inventory management data including shipments, tracking numbers, checkpoints, order numbers, etc. and creates a relational model where the different types of data are connected. They use CockroachDB as the central, physical, and logical place to store all of the data that powers both the mobile consumer app, as well as the post-purchase experience for customers.

Bryan calls CockroachDB the "central heartbeat of their data model" and they currently have around 52 TB of storage available. He also mentioned that they have multiple billion plus record tables in CockroachDB, which is beyond the edge of when he usually starts having performance and scaling issues with other databases.

The diagram below demonstrates how Route runs CockroachDB on AWS. They deploy a containerized model using EKS on top of EC2 nodes with EBS for storage. Currently there are nine nodes in the cluster running across multiple availability zones in a single AWS region.

They feel confident in CockroachDB's "always-on" capabilities and its ability to automatically recover from failures.
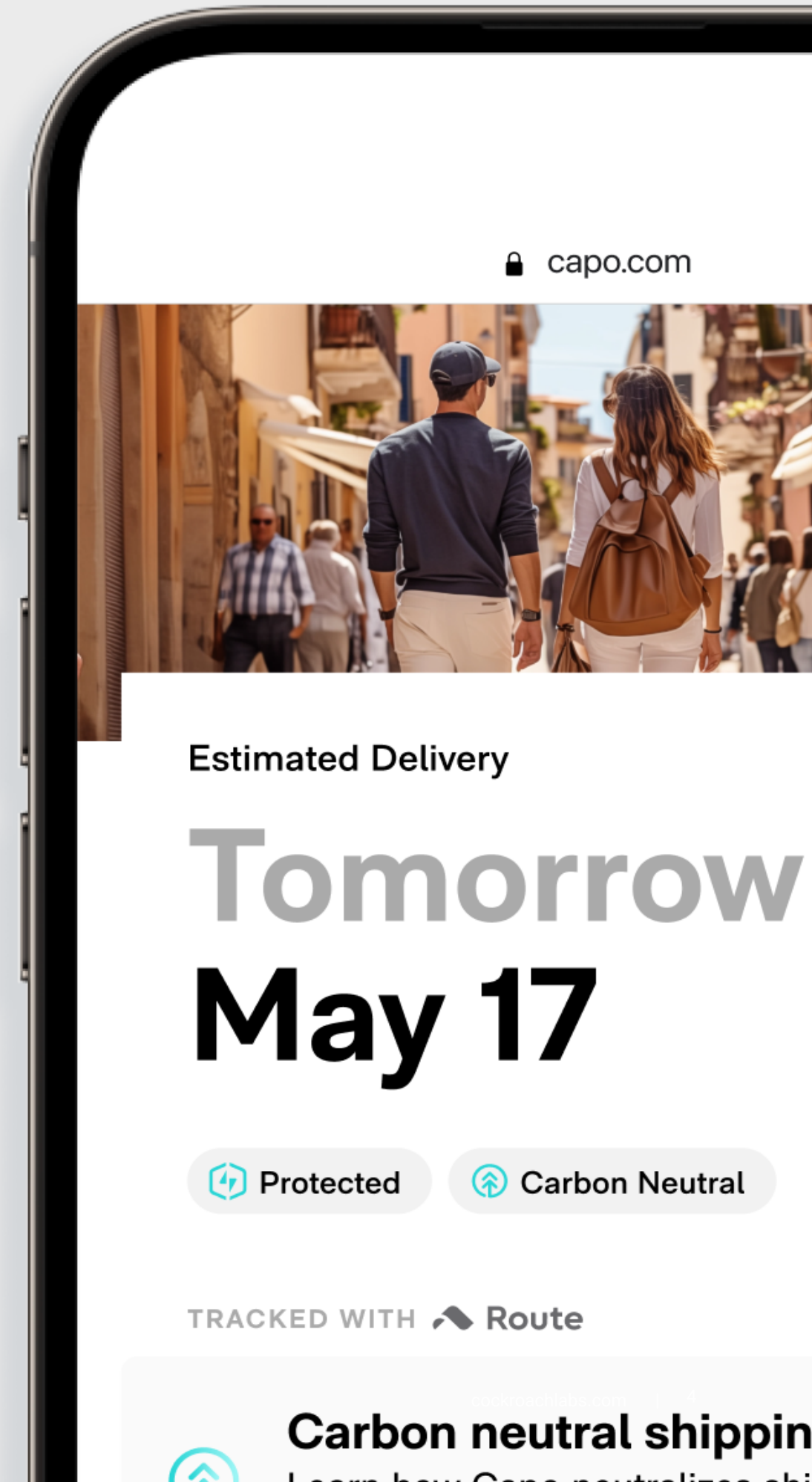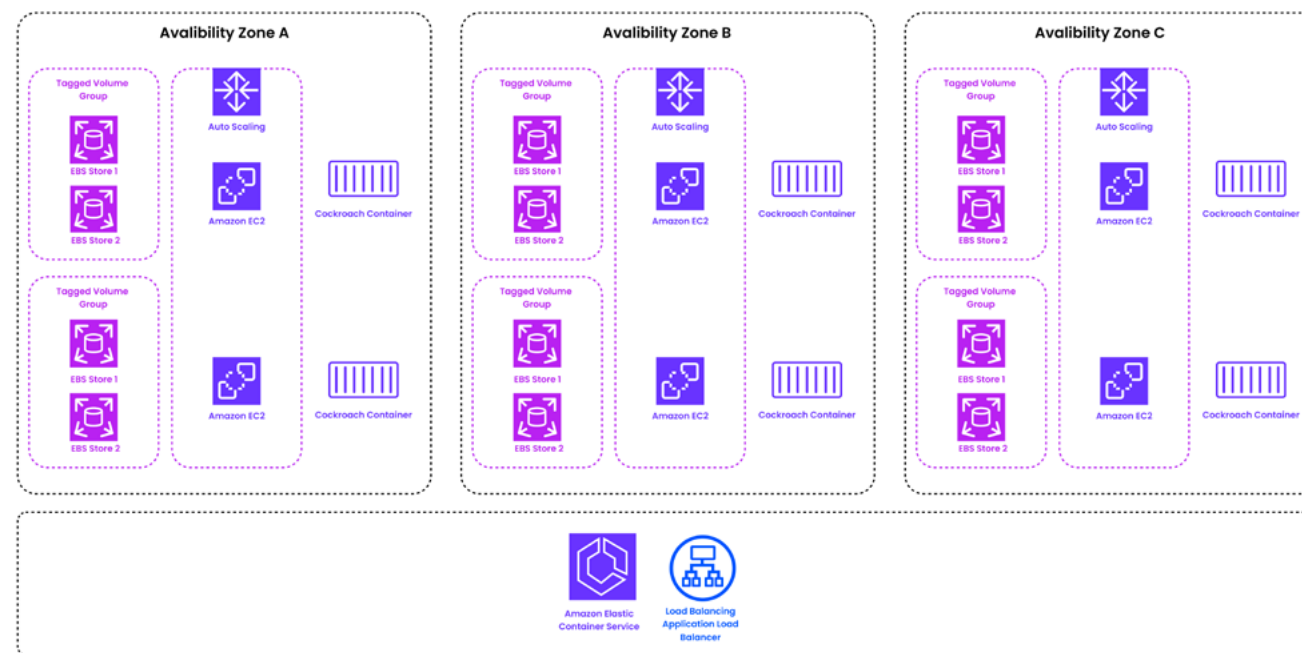
Scaling up and back down

For eCommerce businesses, every November and December is their busiest season, with demand increasing dramatically. Last year, Route decided to make some important changes to their infrastructure ahead of Black Friday and Cyber Monday: they wanted to scale up, increase resilience, and adjust how their storage was being allocated.

With CockroachDB scaling is easy since you can simply add nodes and additional server capacity. Key for eCommerce businesses, you can also scale up for a particular time period and scale back down again to save on costs. CockroachDB allows enterprises to do all this maintenance without taking the database offline – a huge benefit for businesses that can't afford downtime.

Bryan reports that before Black Friday, they were able to change the infrastructure for their CockroachDB databases with zero downtime, zero stress, and zero official maintenance windows.

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"*We all have our war stories when this server crashed or this hardware failure occurred. And that's one of the things I love about CockroachDB. You've got a swarm of Cockroaches working together and you step on any one and they survive. It's exciting to me to have this redundancy where I don't have to worry about any one piece going down. Failures will happen. The question is, are you prepared for them? Can you withstand them? And with CockroachDB for us, the answer is yes.*"

– Bryan Call
Senior Principal Engineer, Route

Embrace the distributed SQL model

Over the past five years, Route has counted on CockroachDB to power and grow its platform. Bryan says that the journey has not always been easy, and you really need to learn CockroachDB to get what you want out of it, but in the end it's worth the investment. He reports that Route's engineering team is embracing CockroachDB's distributed SQL model which has improved their overall reliability.

Bryan also mentioned that Cockroach Labs has made several improvements to the database over the years to help customers like them. For example, the past few releases introduced several updates to CockroachDB's observability tools, which Bryan says has been "phenomenal and gotten us to a point where we feel comfortable."

Finally, Bryan mentioned that it's extremely beneficial to have a good relationship with your account team so that when you do have problems, they understand your workloads and can point you in the right direction.
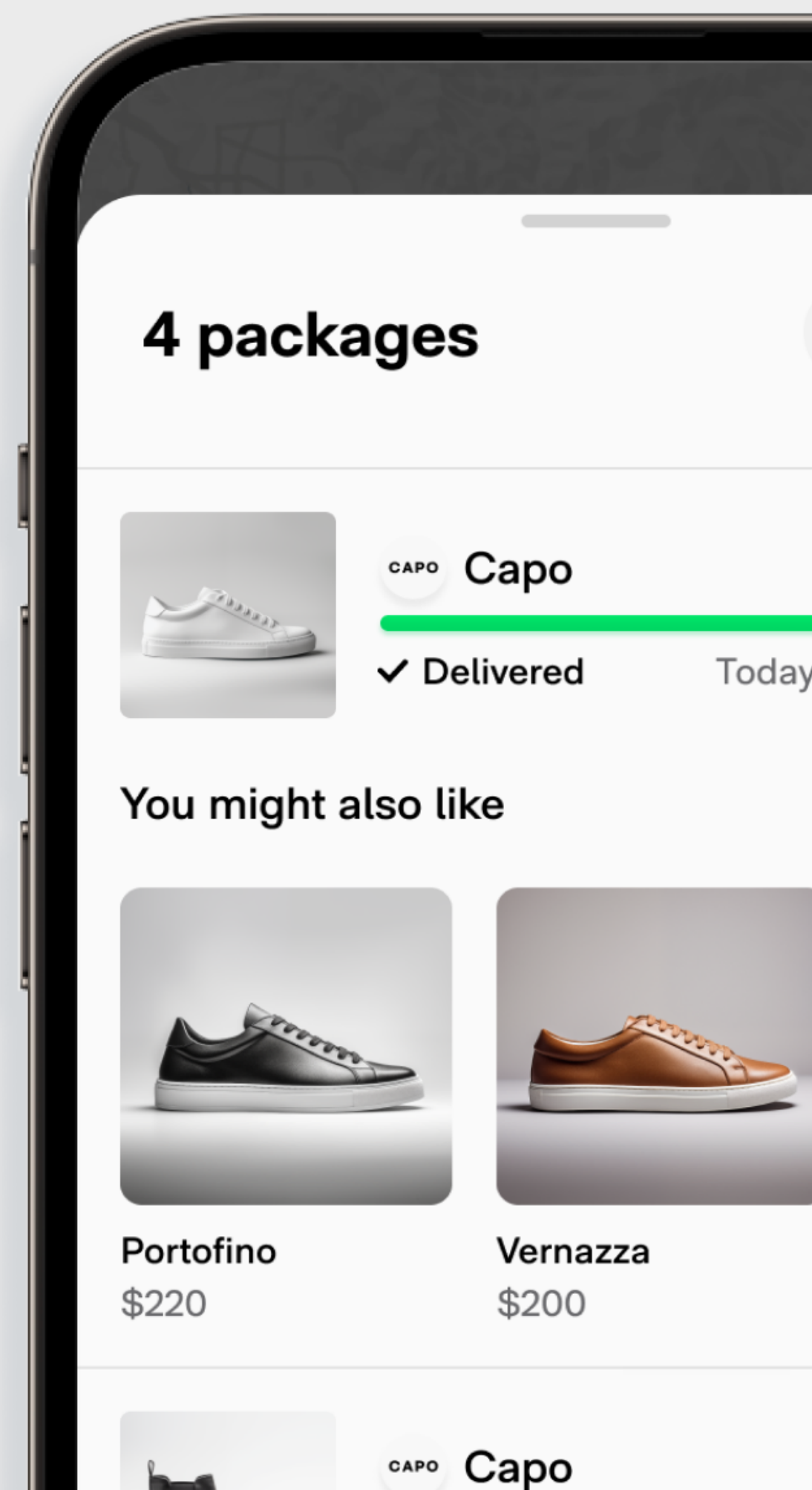
What's Next

Since using CockroachDB, Route has been able to scale without consequence (no downtime) and increase customer satisfaction (internal data clients report having a positive experience).

Route is growing its business and is developing several innovative products that will allow them to deliver the "ultimate post-purchase experience – especially when things go wrong." More and more enterprise brands are turning to Route, and because Route invested in CockroachDB years ago, they are able to meet that enterprise demand.

To learn more about Route and its products, visit route.com.

Ready to get started?

Go hands-on with 100% free CockroachDB Serverless. Spin up your first cluster in just a few clicks.

"*CockroachDB offers the biggest ROI I've seen in terms of paid support from any vendor.*"

– Bryan Call
Senior Principal Engineer, Route