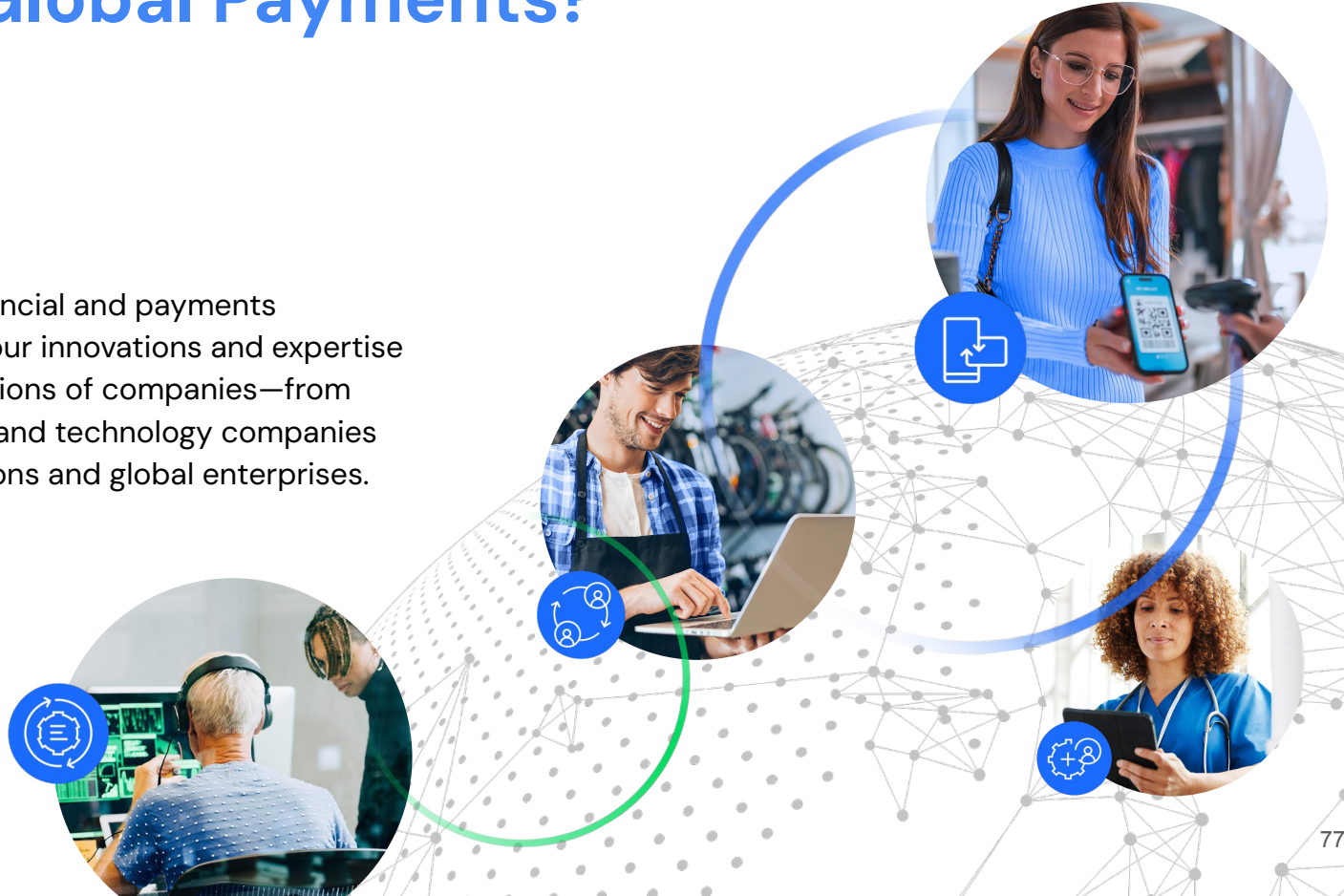


Who is Global Payments?

A Fortune 500® financial and payments technology leader, our innovations and expertise drive growth for millions of companies—from ambitious startups and technology companies to financial institutions and global enterprises.



Every day, we deliver for the world's most forward-looking companies

5m
merchant accounts

>4,000
tech partners

1,500
financial institutions

100+
industries



Data and Database Strategy



**Global
Distribution**



**High
Scalability**



**High
Availability
& Fault
Tolerance**



**Transactional
Consistency**



**Automatic
Data
Replication**



**Geographical
Sharding**



**No Downtime
Schema
Changes &
Upgrades**



**Robust
Compliance
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**Ease of
Use &
Management**



**Integration
with Existing
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AI

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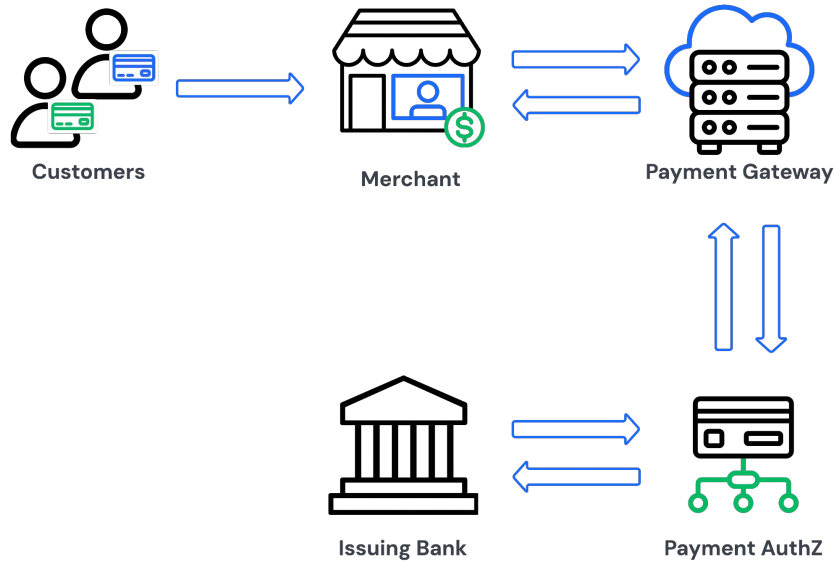


**Integration
with Existing
Tools**

AI

The Challenge

Payment Authorization



High transaction volumes with low latency (< 1s) and high throughput (250+ TPS)

Stringent security & compliance standards to protect sensitive financial data and evolving regulations

Global operations ensuring seamless and reliable payments across different regions of the world

24/7 availability to minimize downtime and ensure uninterrupted service for clients

Evolving technology landscape of new payment methods, technologies, and customer expectations

The Challenge

Legacy Application Limitations



Scalability

Legacy applications struggle to handle increasing volume and user growth



Availability & Resilience

Existing infrastructure lacks robust mechanisms for high availability and disaster recovery



Compliance

Evolving regulatory and data sovereignty requirements typically require manual processes and increased operational overhead



Agility

Monolithic architecture hindered rapid development and deployment of new features and updates

Embracing Cloud-Native

A Transformational Journey



Microservices Architecture

Decoupled services for agility, scalability, and independently deployable services.



Containerization

Leveraged containers for application portability, consistent deployments, and optimized resource utilization.

DevOps Culture

Accelerate transformation by fostering collaboration, automation, and continuous improvement.



Cloud Provider Services

Utilize cloud-native services for enhanced functionality and cost efficiency while reducing overhead.



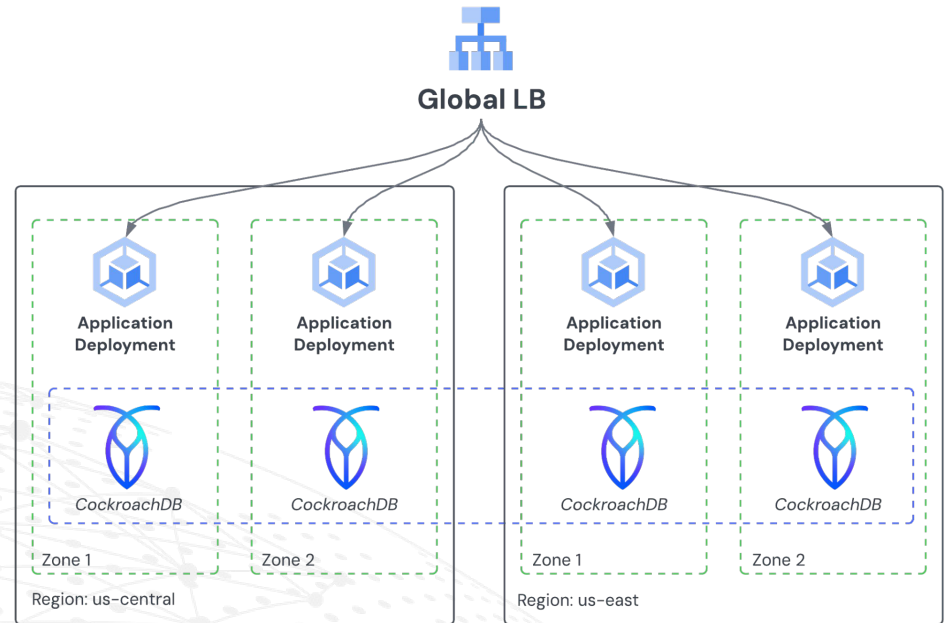
High Level Architecture

A Blueprint for Global Resilience

Multi-Region Deployments for pervasive high availability with disaster avoidance.

Container-Aware Load Balancing dynamically distributing traffic across regions for optimal efficiency and scalability.

CockroachDB at the Core providing the foundation for consistent, scalable, and fault-tolerant transactions across regions.



Cloud Outages Happen

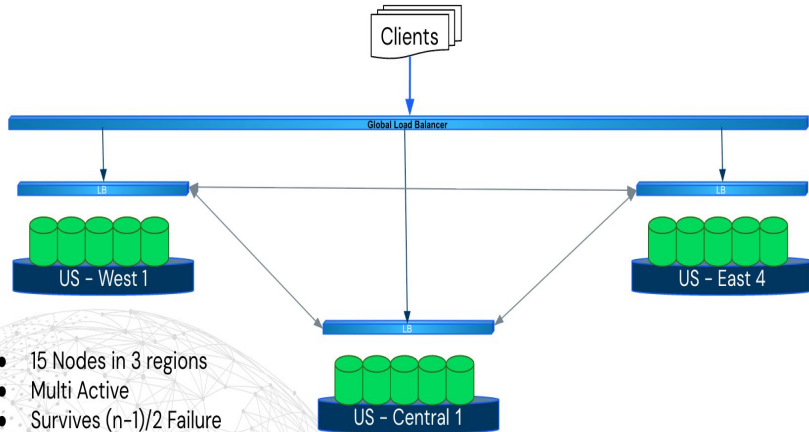
How can you prepare?



CockroachDB

The Foundation for Fault Tolerance

CockroachDB architecture



- 15 Nodes in 3 regions
- Multi Active
- Survives $(n-1)/2$ Failure
- Global Load Balancer distributes traffic based on proximity

Distributed SQL

Scales horizontally with no single point of failure

Automatic Replication

Data replicated across multiple nodes for redundancy

Survivability

Nodes can go down without impacting availability

Automatic Failover

Seamlessly switches to healthy replicas in case of failure

Strong Consistency

Ensures data accuracy even during network partitions

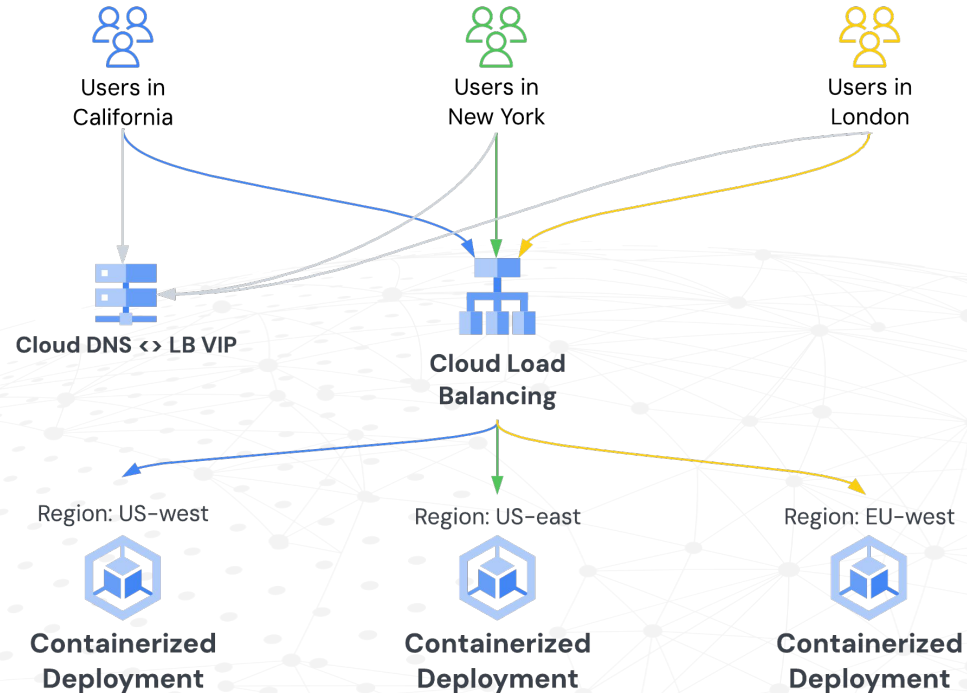
Multi-Region Ingress and Deployment

Adding Another Layer of Resilience

Geographic redundancy protects against regional outages

Reduced latency improves performance for global users

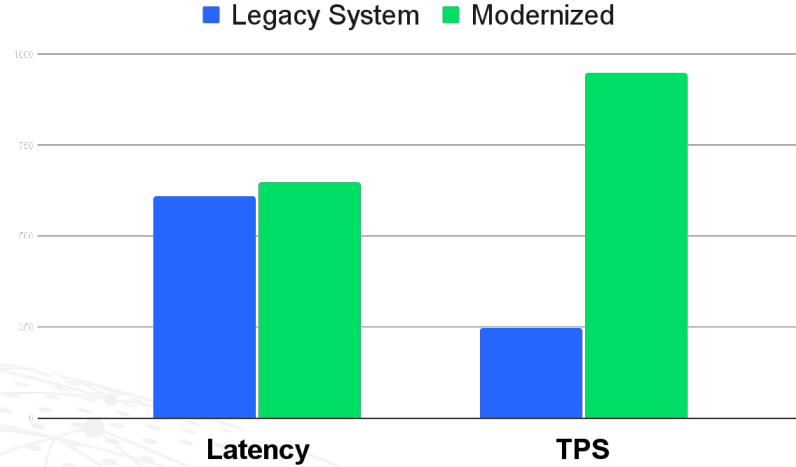
Data sovereignty helps comply with local regulations



Setting New Standards Performance Benchmarks & Results

+380%

System Capacity
with minimal impacts to latency



Setting New Standards

Mission-Critical Reliability

15+

Chaos Experiments

Container and pod deletes
CPU and memory hogs
Node failures
Network interruptions
Simulated regional outages

100%

System Uptime

0

Impacts during Upgrades

Including CockroachDB
upgrades and schema changes

Lessons Learned

1. Understand the Distributed Mindset

CockroachDB behaves differently than traditional RDBMS (Oracle, SQL Server). Schema design, transaction management, and query tuning must account for distributed consistency and latency across nodes.

2. Networking & Latency Are Critical

Even small latency between regions can affect write-heavy workloads — we learned to carefully plan topology (multi-region vs single region).

3. Application Awareness Matters

Applications need to be designed with transaction retries in mind.

4. Schema & Query Design Best Practices

Indexing strategies differ as secondary indexes can have storage/replication tradeoffs. Joins and large aggregations may perform differently than on centralized databases.

5. Operational Tooling & Monitoring

DataDog integration was essential for understanding performance patterns. Backup/restore processes worked but required new runbooks.

What's next?

Building on Success

This transformation is just the beginning. Global Payments will leverage this cloud-native foundation to empower applications, accelerate modernization, expand and extend, and set new standards for reliability and performance.



Expand and Extend

Broaden the architectural design to include additional global regions and explore hybrid cloud capabilities



Platform as a Service

Empower additional applications to modernize through the built foundational platform



Continuous Innovation

Stay ahead of the curve and adopt new cloud-native features and technologies as they become available.



Thank you