

How Razorpay Transitioned to a Secure Data Layer with Zero Downtime



Overview

Razorpay faced high CPU and I/O utilization on their primary MySQL 5.6 datastore and needed to upgrade to MySQL 5.7 with data encryption to meet compliance requirements. As a payment gateway, even a 60-second DNS switchover could cause transaction failures. Mydbops implemented a proxy-routing strategy that enabled a seamless migration to a fully encrypted, optimized database environment with zero end-user disruption while improving performance and scalability for future growth.

- 10x Scalability Headroom**
Reduced CPU/I/O load, enabling 10X scaling.
- 100% Compliance Achieved**
Migrated to a fully encrypted environment.
- Zero Migration Downtime**
Enabled zero-downtime migration with proxy routing.
- Optimized SQL & Schema**
Tuned inefficient SQL queries and lowered overall resource utilization.

RDS MySQL

Consulting Services

About Razorpay

Razorpay aims to revolutionize online payments by providing a simple, affordable, and secure way for small businesses, startups, and traditional SME organizations like schools and colleges to start accepting digital payments. Razorpay serves as a critical financial backbone in India, processing over \$180 billion in annualized Total Payment Volume (TPV) and powering payments for more than 8 million businesses

Deployment Type
Cloud-Based Deployment

Database Stack / Services Used
Migration from RDS MySQL 5.6 to 5.7

Objective / Outcome
Zero Downtime & 10X Scalability Enhancement

Business Challenges

Overview

Razorpay was running MySQL 5.6 as its primary datastore. The business was experiencing high CPU and IO utilization, threatening performance under heavy transaction volumes. They needed to upgrade to MySQL 5.7 and implement encryption to fulfill critical compliance requirements. However, as a high-volume payment gateway, taking the system offline was unacceptable.

- Downtime Constraints:** The application relied on a Route 53 DNS endpoint pointing directly to the database. The minimum Time-To-Live (TTL) supported was 60 seconds, meaning a standard switch to the new database would force at least a 60-second payment outage. The client could not afford this disruption.
- Unpredictable Failover:** Activities on the RDS infrastructure were executed via API calls, making it impossible to estimate an exact time for failovers or node promotions. Razorpay required a transparent solution that eliminated this operational unpredictability.

Goals

- Complete the overall migration to MySQL 5.7 with absolutely zero downtime.
- Implement encryption to fulfill compliance mandates.
- Reduce high resource utilization through database tuning.
- Identify and tune inefficient SQL queries while improving the database schema.
- Ensure dedicated onsite support during the critical migration window.

Solution Provided by Mydbops

To meet the strict zero-downtime requirement for live payments, Mydbops designed a proxy-based transition plan. By combining an intermediate proxy layer with database replication, the team bypassed infrastructure limits and delivered a smooth, risk-free upgrade.

- 01 Secure Setup**
Provisioned a new MySQL 5.7 TDE encrypted cluster smoothly using a safe 5.6 snapshot.
- 02 Data Sync**
Configured external replication to intentionally bypass unpredictable RDS API limits.
- 03 Proxy Routing**
Deployed Maxscale proxy on an EC2 instance to intercept traffic and halt 60s DNS delays.
- 04 Zero-Downtime**
Shifted readers and instantly re-pointed the proxy to transition active live payments.

Secure Cluster Setup:

To meet compliance mandates, the team created a new MySQL 5.7 cluster with Transparent Data Encryption. They populated it using a snapshot from the existing 5.6 replica, ensuring the setup process did not impact live production performance.

Controlled Data Synchronization:

External replication was configured to keep data synced between the legacy 5.6 and the new 5.7 clusters. This bypassed unpredictable, API-driven RDS failovers, giving the team precise manual control to guarantee a safe transition without data loss.

Proxy-Routed Traffic Management:

A mandatory 60-second Route 53 DNS delay directly threatened active payment processing. To solve this, Mydbops deployed a Maxscale proxy on an EC2 instance to manage traffic. Updating the DNS to point to this proxy insulated the application from standard wait times.

Zero-Downtime Cutover:

During the final migration, the reader endpoint was first moved to the 5.7 replicas. Next, the Maxscale proxy was updated to point to the new 5.7 primary node. A quick service restart instantly routed all traffic to the secure 5.7 database, resulting in a transparent switch with zero payment interruptions.

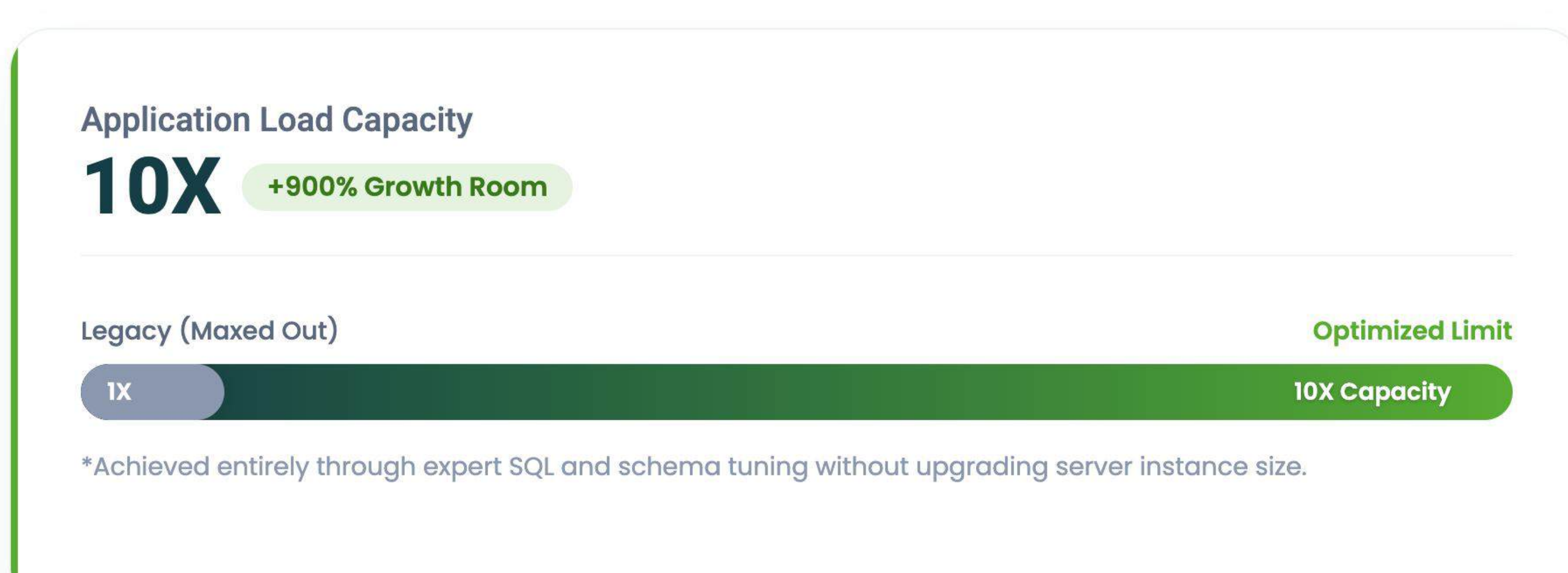
Legacy Setup	vs	Mydbops Architecture
MySQL 5.6 (Unencrypted)		MySQL 5.7 (TDE Encrypted)
Maxed CPU & IO Utilization		Tuned SQL & Schema Layout
60-Second DNS Outage		Zero-Downtime Proxy Cutover
Unpredictable API Failovers		10X Scalability Headroom

Results & Impact

Key Outcomes

10X Scalability Headroom

Proper database tuning significantly reduced CPU and IO load. This optimization provided the operational headroom needed to scale the application load by 10X using the exact same instance configuration.



Zero-Downtime Operations

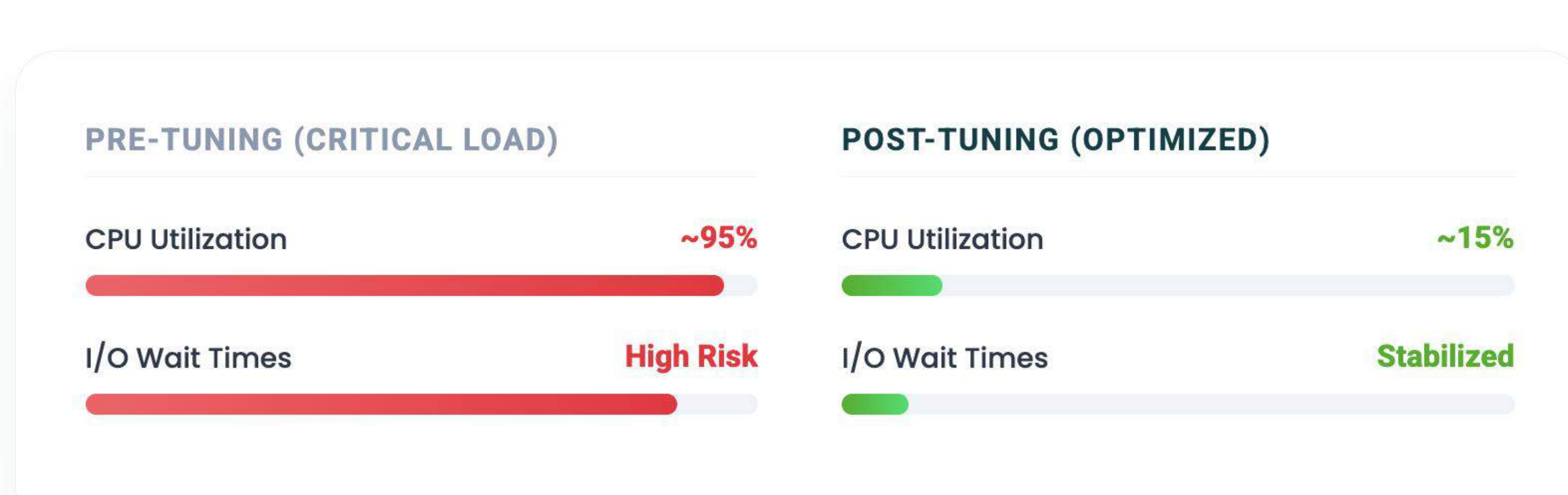
Successfully managed the 60-second DNS limitation and unpredictable API failovers, executing the database migration without dropping a single client transaction.

Ensured Regulatory Compliance

Successfully deployed Transparent Data Encryption, fulfilling all security and compliance requirements necessary for a payment gateway.

Optimized Performance Architecture

Improved overall database health by tuning inefficient SQL queries and refining the schema layout, ensuring sustainable performance for future transaction loads.



Conclusion

Every second of downtime costs a payment gateway lost revenue and consumer trust. When Razorpay needed to upgrade and encrypt their database to meet strict compliance mandates, a standard 60-second outage was simply not an option. By partnering with Mydbops, they bypassed legacy infrastructure constraints using a precise proxy-based routing strategy, turning a highly disruptive performance window into a completely transparent transition.

The business disuptes went far beyond checking a compliance box. Expert database tuning reduced resource consumption so drastically that Razorpay gained the capacity to handle 10X their normal application load on their existing hardware.

Ultimately, they secured their data layer, achieved full compliance, and fortified their infrastructure for massive growth—all without dropping a single payment.

Don't let the fear of downtime dictate your business roadmap.

Ready to modernize your database architecture without sacrificing uptime?

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