blue5green

Secure and Scalable Data Management in Healthcare

Overcoming storage limitations and compliance challenges with a secure, scalable solution

EXECUTIVE SUMMARY

A major healthcare organization encountered serious challenges with limited data storage and strict regulatory requirements. With patient records nearing Salesforce data limits and manual processes slowing operations, the organization faced potential service disruptions and increased licensing costs.

Blue5Green delivered a solution adapted to meet the client's requirements by integrating Salesforce with Heroku's suite of products—including Heroku Connect, Heroku Postgres, and Heroku Private Spaces—to streamline data management and maintain HIPAA compliance. This integration reduced manual data processing by 40% and increased data synchronization speeds by 99%, directly improving operational performance and patient care.

CLIENT BACKGROUND

The client is a recognized healthcare provider dedicated to delivering high-quality patient care in a highly regulated setting. Using a large-scale Salesforce CRM to manage critical patient records, the organization required a solution that addressed both data storage and compliance issues while supporting future growth. With several legacy systems in place, the client needed a system that could integrate with existing infrastructures and adjust as business needs changed.

![blue5green logo]

THE CHALLNEGES

Before implementing a new system, the healthcare provider faced several obstacles that hindered effective data management and compliance. These issues affected both operational performance and patient care.

Storage Saturation:

Salesforce data storage limits were nearly reached, risking system downtime and incurring extra licensing costs. The growing volume of sensitive patient data worsened the situation.

Compliance and Security Risks:

HIPAA standards demand strict encryption, detailed audit trails, and secure data handling. The organization required a system that could protect patient records while allowing prompt access for clinical decisions.
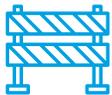
Integration Barriers:

Differences in data schemas and reliance on legacy systems, such as Oracle databases and in-house EHR systems, created challenges for real-time data exchange.

Operational Inefficiencies:

Manual data management tasks consumed significant time, leading to delays in compliance reporting and affecting patient care outcomes. IT leadership needed a system that automated data archival, reconciliation, and error handling through dependable ETL processes.

These issues were of great concern to IT leaders, as they directly influenced daily operations, overall efficiency, and the organization's market positioning.

THE SOLUTION

To address these challenges, Blue5Green developed a comprehensive solution that integrated Salesforce with Heroku's cloud tools. This approach automated key processes, secured data, and improved overall efficiency.

Real-Time Data Synchronization:

Heroku Connect Integration: Enabled bidirectional, real-time synchronization between Salesforce and Heroku Postgres. Data was organized into a three-tier model:

- **Hot Schema:** TActive patient data remains in Salesforce for immediate access.
- **Warm Schema:** Frequently accessed records are stored in Heroku Postgres for near-real-time retrieval.
- **Cold Schema:** Archived data is stored in Heroku and accessed through Salesforce when needed.

API and Webhook Utilization: Custom RESTful endpoints built with Node.js and Express.js supported secure data exchange and error handling between systems.

Automated Workflows and ETL Processes:

- **Python Cron Jobs:** Scheduled ETL tasks automatically archived data based on preset business rules, reducing manual intervention.
- **Multi-threaded Processing:** Enabled parallel data handling to improve throughput and reduce delays during high-load periods.

Enhanced Security and Compliance:

- **Heroku Private Spaces:** Provided network isolation with encryption in transit and at rest, meeting HIPAA and other regulatory standards.
- **OAuth 2.0 and Role-Based Access Control (RBAC):** Secured API interactions between Salesforce Lightning Components and Heroku Dynos, ensuring that only authorized users could access sensitive data.

- **Audit Trails and Logging:** Combined PostgreSQL triggers with Heroku's LISTEN/NOTIFY system to generate detailed audit logs for real-time monitoring and compliance reporting.

Seamless Integration with Legacy Systems:

- **Custom Middleware:** Addressed schema mismatches and data transformation issues, enabling smooth integration with legacy databases such as Oracle.

- **Configurable Synchronization Protocols:** Consolidated data from various sources—whether from on-premise systems or mobile applications—into a unified repository for analytics and reporting.

Scalability and Future-Proofing:

- **Heroku Dynos Autoscaling:** Automatically allocated resources during peak periods, allowing the system to scale with increasing data volumes and user demand.

- **Cloud-Native Architecture:** Built in a modular manner, making it straightforward to add advanced analytics and machine learning tools in future phases.

RESULTS & BENEFITS

After implementation, the healthcare provider experienced significant improvements in efficiency, security, and cost management, which directly addressed the initial challenges.

Operational Efficiency:

Automated ETL workflows and multi-threaded processing reduced manual data management tasks by 40%, freeing IT resources for strategic solutions.

Accelerated Data Access:

Real-time synchronization and optimized database structures increased data retrieval speeds by 99%, supporting immediate compliance reporting and timely clinical decisions.

Efficiency Gains:

TAutomation cut manual template management by 70%, allowing IT teams to focus on other important tasks.

Cost Savings:

Offloading storage to Heroku Postgres and adopting a pay-as-you-go model reduced overall operational costs.

Strengthened Security and Compliance:

The deployment within Heroku Private Spaces, along with secure API measures and detailed audit logging, met HIPAA requirements and improved data protection.

Scalability:

The system's cloud-native design and autoscaling capabilities allowed it to adjust to higher data volumes and future business needs without performance issues.

CONCLUSION

By delivering a secure, scalable, and integrated Salesforce solution, Blue5Green helped the healthcare organization overcome critical data storage and compliance challenges while improving operational efficiency. This solution illustrates how combining cloud technologies with automated processes and strong security measures can transform healthcare data management.

If you are an IT leader or solution architect facing similar challenges, explore how an integrated Salesforce and Heroku solution can strengthen your data management systems. Contact Blue5Green today to learn more about effective strategies for improving healthcare operations.