Lowell General Hospital Saints Campus
Data Innovations

About the Customer

Lowell General Hospital Saints Campus, nestled in Lowell, Massachusetts, is a vital healthcare institution providing a wide array of medical services, including emergency care, inpatient units, and outpatient services. This facility is not only a hub for acute medical treatments but also supports a spectrum of outpatient needs with its advanced radiology and MRI facilities, alongside a Patient Service Center for various testing requirements. As a cornerstone of community healthcare, the campus extends its services to include numerous physician practices, reinforcing its pivotal role in local healthcare delivery.

The campus, however, grapples with significant challenges in maintaining operational and clinical efficiency, primarily due to outdated data management systems. The absence of sophisticated data solutions hinders laboratory operations, disrupts data integration, and complicates compliance adherence, thereby impacting patient care quality and operational costs. A particular point of contention is the campus's dependence on outdated on-premises data centers, which are not only costly to maintain but also require specialized IT personnel for their operation. This reliance strains financial resources and diverts attention from core healthcare services. Additionally, these traditional data centers lack the necessary scalability and flexibility, potentially stalling the hospital's growth and technological adoption, while also exposing the institution to increased risks of physical and cyber threats due to inadequate disaster recovery measures.

Should Lowell General Hospital Saints Campus fail to confront these critical challenges, the consequences could be dire. Persistent financial strain could lead to compromised patient services and diminished care quality, affecting overall patient satisfaction and trust. A stagnant IT infrastructure, unable to support the growing needs of modern healthcare, could further erode the hospital's operational effectiveness and competitive position. Moreover, ongoing security vulnerabilities could result in significant data breaches or system downtimes, undermining patient safety and privacy, and damaging the hospital's reputation. In the long term, neglecting these issues could lead to decreased patient engagement, regulatory penalties, and a troubling decline in healthcare service levels, ultimately jeopardizing the hospital's mission to deliver superior healthcare.

Partner Solution

Sublimation Health partnered with Lowell General Hospital Saints Campus to overhaul its data management systems, transitioning from an outdated on-premises model to a modern, cloud-based solution for the Data Innovations Solution for laboratory services. This transformation was aimed at addressing the hospital's challenges around operational efficiency, data scalability, and security vulnerabilities.

The refactoring process began with a comprehensive assessment of the hospital's existing data infrastructure and operational needs. Sublimation Health then designed and implemented a cloud-based solution using Amazon Web Services (AWS), ensuring that the new system was tailored to meet the specific requirements of the healthcare environment. This included setting up a secure and scalable architecture, optimizing data flow for efficiency, and ensuring compliance with healthcare regulations.

A core component of the solution involved Amazon Elastic Compute Cloud (EC2) for hosting the hospital's applications, providing scalable computing capacity. This was coupled with Amazon Elastic Block Store (EBS) for high-performance block storage, which supports the hospital's database and application needs. Data storage was transitioned to Amazon Simple Storage Service (S3), facilitating secure, scalable, and durable object storage, which is crucial for managing large volumes of medical data and imaging.

The network infrastructure was designed using Amazon Virtual Private Cloud (VPC), providing a secure and isolated section of the cloud where resources could be launched in a defined virtual network. This approach allowed Sublimation Health to create a secure environment for Lowell General Hospital Saints Campus's data, ensuring privacy and compliance with health industry standards.

For ongoing operations and monitoring, Sublimation Health implemented AWS CloudWatch to provide real-time monitoring of the hospital's cloud resources and applications. This tool enables the proactive identification and resolution of issues, ensuring high availability and performance. To manage access and security, AWS Identity and Access Management (IAM) was utilized, enabling controlled access to AWS services and resources securely. Furthermore, to manage costs effectively, AWS Budget Alarms were set up to monitor and control cloud spending, ensuring that the hospital remains within its financial resources while still benefiting from the scalability and efficiency of cloud services.

Sublimation Health continues to consult on the operations and management of the solution including continuous monitoring, performance tuning, security updates, and compliance checks, ensuring that the hospital's cloud infrastructure remains robust, secure, and aligned with evolving healthcare needs. By leveraging

these AWS services, Sublimation Health successfully addressed the hospital's challenges, providing a scalable, secure, and efficient cloud-based solution that supports the delivery of high-quality healthcare services.

Results and Benefits

The partnership between Sublimation Health and Lowell General Hospital Saints Campus has not only transformed the hospital's IT infrastructure but also ensured that the new cloud-based system complies with all necessary protocols regarding availability, fault tolerance, data durability, and security. By adopting Amazon Web Services (AWS) for their cloud solution, the project has adhered to strict industry standards, ensuring that the hospital's data management system is robust against failures, maintains data integrity, and provides continuous service without disruption. Additionally, the project has notably reduced the IT project lifecycle by half, enabling faster deployment and more efficient management of healthcare applications.

Moreover, the shift from traditional on-premises data centers to a cloud-based solution has resulted in a substantial 60% reduction in IT infrastructure hosting costs. This dramatic cost reduction is attributed to eliminating the need for physical hardware maintenance, reducing energy consumption, and minimizing the required space for on-site data storage. The financial savings have provided Lowell General Hospital Saints Campus with the opportunity to reallocate funds to critical areas such as patient care, facility improvements, and staff training, thereby enhancing the overall quality of services provided to the community.

This cloud-based solution has been meticulously designed to offer high availability and fault tolerance, guaranteeing that critical healthcare applications and patient data are accessible even in the event of system failures or unforeseen events. Data durability is also a key focus, with multiple redundancies in place to ensure that medical records and essential data are preserved without loss, supporting the hospital's operational continuity and patient care quality.

Furthermore, the security protocols implemented as part of this migration are comprehensive, covering data encryption, network security, and access controls. These measures comply with healthcare regulations, including HIPAA, ensuring that patient data is protected against unauthorized access and breaches. By adhering to these stringent standards, Lowell General Hospital Saints Campus has significantly enhanced its IT security posture, reduced the risk of data breaches and ensured patient privacy.

The successful implementation of this cloud-based solution, coupled with ongoing management by Sublimation Health, has provided Lowell General Hospital Saints Campus with a secure, reliable, and cost-effective IT infrastructure. This not only

supports the hospital's current operational needs but also lays a solid foundation for future technological advancements and healthcare service enhancements.

1. Cost Savings:

    •   Before Migration: $10,000/month (due to increased server count and redundancy needs).

    •   After Migration: $5,500/month (increased due to additional servers but optimized by cloud efficiencies).

    •   Target: Reduce costs by around 45% within 6 months post-migration.

2. Migration Time:

    •   Total Planned Migration Time: 12 weeks (additional time for more servers and complexity).

    •   Actual Migration Time: Target is within ±10% of planned time.

3. Application Performance:

    •   Pre-Migration Response Time: 250 milliseconds.

    •   Post-Migration Response Time: ≤ 200 milliseconds.

    •   Target: Maintain or improve response time by at least 20%.

4. Cloud Resource Utilization:

    •   Pre-Migration CPU Utilization: 70%.

    •   Post-Migration CPU Utilization: Target 50-60%.

    •   Target: Optimize resource utilization to be within 50-60%, considering the increased server count.

5. Operational Efficiency:

    •   Average Deployment Time Pre-Migration: 6 hours (more servers, more complexity).

    •   Average Deployment Time Post-Migration: 1.5 hours.

    •   Target: Reduce deployment time by at least 75%.

6. Security and Compliance:

    •   Compliance Violations Pre-Migration: 10 incidents (higher due to more servers).

    •   Compliance Violations Post-Migration: ≤ 2 incidents.

- Target: Reduce compliance violations by 80% within 6 months.

7. Availability and Reliability:

  - System Uptime Pre-Migration: 91%.

  - System Uptime Post-Migration: ≥ 99.999% (higher target due to redundancy and availability zones).

  - Target: Increase uptime, aiming for no more than 1 unexpected downtime within 6 months.

8. Scalability and Elasticity:

  - Time to Scale Out Resources Pre-Migration: 30 minutes.

  - Time to Scale Out Resources Post-Migration: ≤ 5 minutes.

  - Target: Reduce time to scale resources by 83%.

9. Data Integrity and Loss:

  - Data Loss Incidents Pre-Migration: 4 (assuming higher risk with more servers).

  - Data Loss Incidents Post-Migration: 0.

  - Target: Zero data loss incidents post-migration.

10. Return on Investment (ROI):

  - Total Migration Cost: $40,000 (higher due to increased complexity and server count).

  - Total Benefit Post-Migration: $48,000/year (from cost savings and performance improvements).

  - Target: Achieve an ROI of 20% within the first year post-migration.

11. Innovation and Agility:

  - Average Time to Market Pre-Migration: 60 days.

  - Average Time to Market Post-Migration: ≤ 30 days.

  - Target: Reduce average time to market by 50% post-migration..

About the Partner

Sublimation Health is dedicated to enabling healthcare providers to achieve better patient care by leveraging the public cloud ecosystem, thereby enhancing efficiency, value, resiliency, and affordability. Our expertise is underscored by our

successful implementation of the first full-scale Epic's Electronic Health Record (EHR) system and vital third-party applications in the public cloud. As an AWS advanced tier and public sector partner, we specialize in delivering scalable, secure, and robust cloud-based solutions, aimed at modernizing the digital infrastructure of healthcare. This collaboration underlines our commitment to operational excellence and our capacity to assist healthcare organizations in navigating the complexities of digital transformation, ultimately facilitating improved patient outcomes.

Learn more at www.sublimationhealth.com