

Fairfax County Public Health Laboratory: Modernization Through Cloud Migration

Innovations in Informatics: Laboratory Success Stories

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The situation

Before adopting a cloud solution, the Fairfax County Public Health Laboratory faced multiple operational limitations and challenges. The laboratory needed a secure, scalable and flexible data management system that could meet stringent security and compliance standards, accommodate increased data volumes and streamline workflows for a diverse user base. Challenges included ensuring HIPAA compliance, reducing manual data entry and managing high volumes of data efficiently within the constraints of the county's network infrastructure. The laboratory also faced the hurdle of gaining approval from central IT, which required clear demonstration of the cloud's technical and security benefits.

The solution

To overcome these challenges, Fairfax County Public Health Laboratory took on the task of migrating its infrastructure to Oracle Cloud Infrastructure (OCI). OCI provides enhanced storage, secure access controls and a scalable environment adaptable to changing demands. The data itself is owned by Fairfax County, while the hosting is managed by Oracle's external cloud infrastructure. Security is maintained using a VPN, allowing data to be safely accessed while leveraging external cloud servers. This shift enables seamless data distribution and integration with external partners, significantly improving the laboratory's capacity and flexibility. By utilizing OCI, the laboratory can mitigate previous network limitations and build a robust system for its data management needs.

The scalability and flexibility of OCI enable the laboratory to handle higher data throughput as demands grow. These enhancements not only streamline internal operations but also bolster the laboratory's ability to support public health efforts by ensuring reliable, efficient and secure data management. Moreover, OCI's cloud-based solution proves more cost-effective compared to traditional in-house systems, providing a future-ready platform that balances performance and affordability.

Impact

The implementation of OCI at Fairfax County Public Health Laboratory will bring transformative improvements to data management, security and operational efficiency. Key advancements include enhanced security through measures like single sign-on (SSO) and VPN technology, which streamline secure data access and transmission. Additional features, such as subnet mapping and controlled machine configurations, strengthen cybersecurity and ensure compliance with HIPAA and CLIA standards. These measures safeguard data integrity and confidentiality while providing a scalable framework that adapts to evolving threats and regulations.

OCI's cloud-based infrastructure significantly increases the laboratory's data storage capacity, eliminating the limitations of on-premises systems. With virtually unlimited storage, the laboratory can meet current data demands while accommodating future growth. This capability supports high-throughput workflows like genomic sequencing and real-time surveillance, improving operational efficiency and readiness for public health emergencies.

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Reflections

Collaboration

Securing approval from multiple stakeholders (IT, Financial, Procurement and Legal) was crucial. Building trust and aligning goals across departments enabled the laboratory to make a strong case for migration and foster collaboration. Successful migration required a foundation of partnership and trust between the laboratory, the vendor, IT and service providers. Clear communication and strong relationships were fundamental to overcoming challenges and ensuring alignment of goals.

Challenges

Navigating the approval process required addressing numerous technical aspects and proving the benefits of cloud migration, which was time-intensive but essential to success. An important consideration raised was the potential divergence in security requirements between the laboratory and the vendor. If such a situation were to arise, liability would rest with the laboratory, potentially requiring a decoupling from the vendor and a rebuild of the solution. This underlines the criticality of establishing strong contractual agreements and shared security standards.

Suggestions for others

Laboratories considering cloud migration should assess their primary goals and identify other laboratories with similar experiences. Understanding data governance, scalability and compliance in a cloud environment is key to a successful transition. A crucial element to the success of this migration was having a central coordinator to manage the transition and implementation.

Up next

Fairfax County Public Health Laboratory will continue optimizing its OCI-based infrastructure, exploring ways to further enhance data security and operational scalability. By expanding partnerships and continuing to build data resilience, the laboratory aims to set a precedent for efficient cloud-based operations in public health laboratories.

The laboratory is currently in a high state of operational readiness. The current focus is on completing the mapping of subnets and machine configurations, followed by firewall confirmations before full handover to laboratory operations. Cloud migration showcases the power of innovative, scalable infrastructure in advancing public health informatics.

The next phase will involve integrating OCI with Azure to create a data lake, enabling greater data availability across state levels. Additionally, Fairfax County has the goal to further enhance data sharing collaborative efforts with local and state partners, to position itself for readiness for upcoming TEFCAs requirements.

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