Case Study

Empowering Breakthroughs:

Duke University School of Medicine's Azure HPC Transformation

Discover how Duke University School of Medicine leveraged Azure High-Performance Computing to overcome the limitations of on-premises systems, unlocking new research potential in genomics, personalized medicine, and more.

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Introduction

The Duke University School of Medicine has long been recognized as a leader in medical research, fostering innovations that have a direct impact on the future of healthcare. However, the rapid pace of technological advancement and the explosion of data in fields like genomics, computational biology, and personalized medicine placed increasing demands on their existing infrastructure. Like many prestigious medical institutions, Duke's research efforts were reliant on High-Performance Computing (HPC) systems housed on-premises, systems that once served as the backbone of their research.

As medical research grew more computationally intensive, Duke faced the challenge of an aging infrastructure that could no longer keep up with the pace of modern research. The university found itself constrained by limited scalability, growing operational inefficiencies, and the rising complexity of maintaining data security and compliance.

Recognizing that their ability to continue innovating depended on addressing these challenges, Duke sought a transformational solution that would empower their researchers to push the boundaries of science without being hindered by technological limitations.

In partnership with Oakwood Systems and leveraging Microsoft's Azure HPC platform, the Duke University School of Medicine embarked on a journey that would revolutionize their research capabilities. This case study explores the transition from on-premises systems to the cloud, highlighting the impact this shift had on Duke's ability to scale, innovate, and maintain the rigorous security and compliance standards that define medical research.

Duke University School of Medicine

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Business Challenges

For years, Duke University's on-premises HPC systems had been the cornerstone of their research initiatives. However, as medical research expanded in complexity and scope, particularly in computationally heavy fields like genomics and personalized medicine, these systems began to falter. The limitations of their existing infrastructure presented significant challenges. Scalability became a major concern as the university struggled to support the immense computational demands required for data-intensive research. This inability to scale not only restricted the type of research Duke could conduct but also delayed critical studies, slowing the path to innovation.

In addition to scalability issues, the operational burden of managing and maintaining physical infrastructure grew increasingly problematic. The cost and effort required to keep these systems running efficiently began to outweigh their benefits. Researchers and IT staff alike faced the challenge of balancing innovation with the day-to-day demands of system upkeep, diverting attention from groundbreaking research. The situation was further complicated by evolving cybersecurity threats and stringent data compliance regulations, which placed pressure on Duke to ensure that sensitive research data remained protected.

These challenges weren't unique to Duke University. Many higher education institutions grappled with the same issues, yet the urgency at Duke was amplified by their commitment to being at the forefront of medical research. The university realized that continuing down this path would hinder its potential, necessitating a move to a more flexible and scalable solution.

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Solution

To address these challenges, Duke University partnered with Oakwood Systems to transition from on-premises HPC infrastructure to Azure High-Performance Computing. Azure HPC provided scalable computing power on demand, enabling researchers to handle large datasets and run complex simulations with ease. The cloud platform alleviated the operational burden of maintaining physical infrastructure, allowing Duke to focus on innovation rather than system upkeep.

With Azure's advanced AI and Machine Learning capabilities, Duke enhanced its data processing and research potential, especially in data-heavy fields like genomics. The transition also strengthened security and compliance, ensuring that sensitive research data remained protected while fostering greater collaboration both within Duke and with external institutions.

Outcome

The transition to Azure HPC significantly improved Duke University's research capabilities. Researchers were able to process large datasets more efficiently and conduct complex simulations without delays, leading to faster breakthroughs in fields like genomics. Operational costs were reduced, as the need to maintain physical infrastructure was eliminated, and IT staff could focus on supporting innovation.

About Oakwood

Our Team of seasoned professionals delivers unparalleled expertise in consulting and implementation services across the Microsoft Azure stack, ensuring our clients harness the full potential of their technology investments. With a commitment to excellence and a passion for driving business success, Oakwood Systems stands at the forefront of technological innovation, helping businesses navigate and excel in today's fast-paced digital landscape.

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