



EMPOWERING GENOMIC RESEARCH AND UNRAVELING SCIENTIFIC MYSTERIES THROUGH COLLABORATION AND CONNECTIVITY

Overview

In the vast landscape of scientific exploration, few endeavors hold as much promise and significance as genomics. Genomics, the study of an organism's complete set of DNA, has transcended scientific boundaries and is impacting every corner of our lives. It is a discipline that holds the key to diagnosing genetic diseases, particularly for those born with undiagnosed conditions that have long eluded traditional diagnoses, and paving the way for groundbreaking advancements in both human and plant life.

The [HudsonAlpha Institute for Biotechnology](#) (HudsonAlpha), located in Huntsville Alabama, uses the power of genomics to improve life. The Institute's focus spans from human genomics, providing answers to families dealing with undiagnosed diseases, to plant genomics, and includes collaborating with NASA in space station research. Its pioneering work is rooted in the potential of genomics to unlock medical and scientific mysteries, saving lives, and reshaping the future. HudsonAlpha has emerged as a beacon of hope, as well as a driver of change and innovation. HudsonAlpha is also home to over 50 other life sciences companies that grow their missions across its 150-acre campus.

While this emerging discipline within the practice of medical science promises far reaching implications, the immense computational power required to analyze vast genetic datasets is a critical need for HudsonAlpha's groundbreaking work. Genomic research's data-intensive nature demands robust support. HudsonAlpha's work, research, and applications rely on advanced computing to unravel the genetic code of life. DC BLOX has played a key role in bolstering HudsonAlpha's digital capacity, enabling continued success in genomics.



AT THE FOREFRONT OF GENOMIC RESEARCH, HUDSONALPHA WAS FACED WITH A MYRIAD OF COMPLEX CHALLENGES.

Challenges

The vast amount of data generated, a staggering petabyte per month, posed a significant dilemma. With samples arriving at their lab and undergoing a meticulous extraction and sequencing process, it was the post-sequencing data analysis that held the key to innovation and discovery. As researchers were making groundbreaking findings constantly, the demand for power and storage capacity grew exponentially. HudsonAlpha was processing samples at an ever-accelerating rate, and the need for reliable infrastructure for the secondary analysis became increasingly apparent.

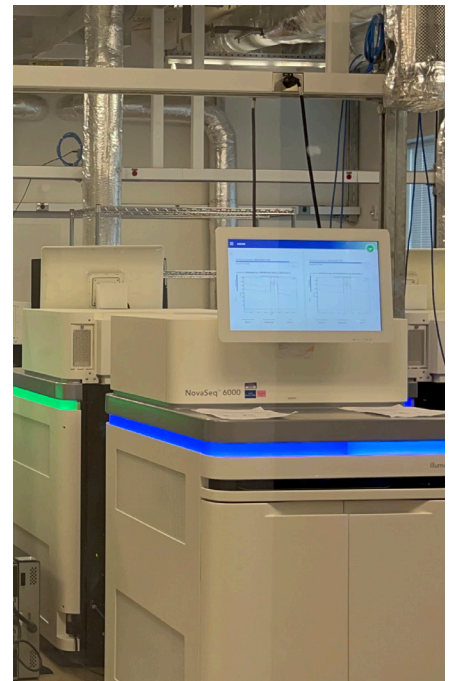
Furthermore, the field of genomics is in a perpetual state of evolution, with datasets of unprecedented size. Managing one of the largest datasets in the industry required immense power, particularly for high-performance computing (HPC) and extensive cooling systems. These challenges were formidable and well beyond what an organization could feasibly handle alone. The need for a partner like DC BLOX became evident, as HudsonAlpha sought a solution to effectively and efficiently manage its data, processing, and compute requirements.

In this ever-evolving landscape, where the pace of research and discovery is relentless, HudsonAlpha's selection of DC BLOX played a role in addressing these challenges and advancing the frontiers of genomics research and discovery. This partnership allowed HudsonAlpha to overcome its infrastructure and capacity hurdles, ultimately supporting its mission of improving life through genomics.

Solution

HudsonAlpha diligently explored potential vendors to meet its complex data and computing needs and geographic location. In this careful consideration, the Institute discovered that DC BLOX stood out as a strong choice for a multitude of positive reasons.

One of the primary factors that influenced HudsonAlpha's decision was the strategic location of DC BLOX's data center. Situated conveniently down the street from HudsonAlpha, this proximity offered not only ease of access but also immediate, high-speed connectivity through the Huntsville fiber ring. Such close quarters ensured that data transfers and analytics were swift and efficient, a crucial aspect of consideration. HudsonAlpha initially considered hosting its datasets in the public cloud,



Genomic research has some of the largest data sets you will find in the industry. Our requirements are vast and resource intensive. It's very difficult for an organization to do alone. Finding a partner like DC BLOX was critical.

Scott Ross, CIO for HudsonAlpha

but found that the cost of moving and analyzing such a vast amount of data in the provider's closest region in northern Virginia was prohibitively expensive. Data gravity dictated that a more local solution was needed.

Furthermore, the pre-existing relationship between DC BLOX and HudsonAlpha played a fundamental role in continuing to collaborate. The individual who introduced HudsonAlpha to DC BLOX had a history of serving HudsonAlpha for over 15 years, building a relationship based on trust, reliability, and a deep understanding of HudsonAlpha's unique needs. This history of mutual understanding and collaboration made DC BLOX the natural choice for HudsonAlpha's ambitious project.

Additionally, DC BLOX's ability to provide the critical power and cooling solutions required to sustain a [high-performance computing](#) environment was a significant factor in HudsonAlpha's decision. HudsonAlpha had moved HPC clusters to the [Huntsville data center](#) because of the cost of upgrading its own environment to support these systems as they scaled. Given the immense data generated by genomic research, reliable and scalable storage was paramount, and DC BLOX's object storage capabilities ensured that HudsonAlpha's data had a secure and efficient home. In the second phase of their tenancy, they are expanding to fill an entire pod, wired for 60kW critical load to incorporate even more HPC clusters.

Security, sustainability, and community involvement were also key considerations for HudsonAlpha. DC BLOX's unwavering commitment to providing a secure and sustainable environment perfectly aligned with their needs, further solidifying the partnership. DC BLOX's active involvement in the local community resonated well with HudsonAlpha's own dedication to serving the local area. HudsonAlpha's participation in community events, sponsorships, and volunteer work demonstrated a shared commitment to the region.



DC BLOX's [connectivity solutions](#) through the southeastern US played an important role in helping HudsonAlpha use genomics to improve life. While Huntsville tends to be a technologically advanced area, it remains a mid-sized market without the same level of resources as larger metropolitan cities. Having a local partner, just a mile from the HudsonAlpha campus, that could provide high-capacity, low-latency fiber connectivity

Sequencing instruments are game changers in genomic research, but they create more technology demand in order to process samples faster. The data has to go somewhere for secondary analysis, creating more demand on the backend infrastructure necessary.

Scott Ross, CIO for HudsonAlpha

between the HudsonAlpha campus and DC BLOX's Huntsville data center was essential for pushing vast amounts of data reliably for research purposes. The breadth of connectivity options available from DC BLOX's data center with its regional network, public cloud access, and stability of built-in carriers enabled the campus to connect with the wider world.

DC BLOX's role in bringing these critical resources literally to their doorstep demonstrated their dedication to addressing HudsonAlpha's specific requirements and contributing to its success.

HudsonAlpha's project needs evolved as it expanded and outgrew its own enterprise data center solutions. The Institute had initially maintained two data centers, but found that the cost of upgrading them to meet computing needs exceeded the benefits. The Institute was growing at such a remarkable pace that it was readily apparent that its office floor space was better utilized for laboratory purposes. To address these changing needs, a phased approach was taken to prioritize systems to be moved to DC BLOX's data center, carefully planning each step to ensure that network connectivity and critical dependencies were established before commencing the relocation.

The scope of services started with a storage project, with DC BLOX accommodating five petabytes of data. As technology advanced, HudsonAlpha sought more cost-effective ways to manage its data and moved towards a colocation strategy, transitioning to its own data center pods. Presently, HudsonAlpha has 13 cabinets with DC BLOX, and it has reserved an entire pod with 18 racks, with plans for further expansion. This evolving approach demonstrates the flexibility, adaptability, and scalability of both HudsonAlpha and DC BLOX in responding to the dynamic needs of genomic research and technology infrastructure.

Current solutions DC BLOX is providing include:

- Colocation in the DC BLOX Huntsville data center for primary HPC environment.
- Transit Services for reliable Internet connectivity from DC BLOX's Huntsville data center.
- Managed Network Services to manage the on-premises deployment and ongoing operations for redundant carrier connections from HudsonAlpha's campus to DC BLOX's data center.
- Cloud Ramps to 56 Marietta for direct access to Microsoft Azure cloud services with the ability to reach other public cloud providers in the future.

The world is changing and the ability to find local options is a major impact. Having a partner a mile from our campus with low-latency connectivity was a requirement. This was critical not only for the purpose of research and for data to flow across networks reliably, but because there are use cases our campus has produced that need to be accessed by the rest of the world. DC BLOX helped bring critical resources from a state away to right down the street.

Scott Ross, CIO for HudsonAlpha

A TRANSFORMATIVE JOURNEY DRIVEN BY FLEXIBILITY AND CUSTOMER SERVICE

Performance

HudsonAlpha embarked on a transformative journey with DC BLOX, and the partnership was marked by a mutual commitment to flexibility and customer service. Challenges emerged early in the collaboration, but these challenges are part of the journey and became integral to the relationship's growth. HudsonAlpha initially started with a specific set of services, but it quickly became apparent that adjustments were necessary to better align with its evolving needs. What set DC BLOX apart was its willingness to adapt to these changing circumstances, which can be rare in the industry. Most data centers might offer limited options and let you buy out, but DC BLOX's customer-focused approach allowed it to accommodate evolving needs seamlessly.

A testament to this adaptability is the example of Dragon Pads technology to expedite the genomic research pipeline, a highly serialized process with multiple steps and stages. DC BLOX provided bare metal servers to support this crucial device, ensuring that HudsonAlpha's infrastructure aligned with the demands of their work. And, when it became evident that the initial Infrastructure as a Service (IaaS) approach didn't fit their evolving needs, DC BLOX promptly adjusted their contract. These changes occurred mid- and early-term in their agreements, showcasing DC BLOX's commitment to supporting HudsonAlpha's rapid evolution and growth.

Another significant transition involved data storage. When HudsonAlpha initially joined forces with DC BLOX, it required petabytes of object storage. However, as its requirements changed over time, the Institute's data storage footprint was reduced, while its [colocation](#) needs grew.

As Scott Ross, CIO of HudsonAlpha put it, "Being able to work with DC BLOX and combine our engineers and architects with theirs has been valuable. This collaborative approach allowed both teams to align their expertise and provide tailored support that met HudsonAlpha's unique needs, further highlighting the adaptability and customer service commitment of DC BLOX."



Conclusion

In the realm of genomic research, the pursuit of answers to the most profound questions often comes with an agonizing dilemma: children born with unexplained illnesses and the heart-wrenching journey faced by their families, or newfound pests and diseases that wipe out a year's worth of crops and much-needed food supply. However, this poignant narrative underscores the deeper significance of our partnership with HudsonAlpha. It is a partnership rooted in a broader societal need — the need to make resources available that would otherwise be consumed by managing infrastructure and costs, enabling HudsonAlpha to invest more effectively in groundbreaking research. As a non-profit organization primarily driven by grants, efficiency is paramount, and it takes partners like DC BLOX that truly understand the essence of collaboration and provide the support needed for HudsonAlpha and its critical mission.

Genomic research, with its potential to revolutionize healthcare, aligns seamlessly with the compute workloads supported by DC BLOX. The ability to support advanced digital infrastructure and high-performance computing capabilities empowered HudsonAlpha to harness the vast genetic data it generates, furthering its capacity to deliver life-saving services. Through regional partnerships, we provide low-latency networking, reliable power and cooling, and a secure facility that HudsonAlpha required to bolster its research, all while ensuring its efficiency and success. The combined strengths of both organizations validate the path taken and underscore the importance of this collaboration in making the world a better place, one life-saving discovery at a time.

This is the essence of what DC BLOX does — providing the foundational infrastructure to enable partners like HudsonAlpha to make a profound difference in the world of genomic research and healthcare, through the power of advanced computing and collaborative innovation.

About DC BLOX

DC BLOX owns and operates interconnected multi-tenant data centers that deliver the infrastructure and connectivity essential to power today's digital business. DC BLOX's colocation facilities, robust connectivity ecosystem, dark fiber solutions, and hyperscale-ready data centers provide the digital infrastructure necessary to enable the rapid growth of the Southeast's digital economy. DC BLOX's data centers are located in Birmingham, AL; Huntsville, AL; Chattanooga, TN; Greenville, SC, Myrtle Beach, SC, with others in development near Atlanta and Berkeley County, SC.

About HudsonAlpha

The HudsonAlpha Institute for Biotechnology has a three-fold mission of conducting genomics-based research to improve human health and well being; sparking entrepreneurship and economic development; and providing educational outreach to nurture the next generation of biotech researchers and entrepreneurs, as well as to create a biotech literate public. For more information, please visit www.hudsonalpha.org.



DC BLOX

844-4DCBLOX | DCBLOX.com

CORPORATE OFFICE
1040 Crown Pointe Pkwy, Ste 560
Atlanta, GA 30338

BIRMINGHAM
433 6th St S
Birmingham, AL 35233

CHATTANOOGA
807 East 16th St
Chattanooga, TN 37408

GREENVILLE
33 Global Drive
Greenville, SC 29607

HUNTSVILLE
333 Diamond Dr NW
Huntsville, AL 35806

MYRTLE BEACH
1401 Howard Ave
Myrtle Beach, SC 29577