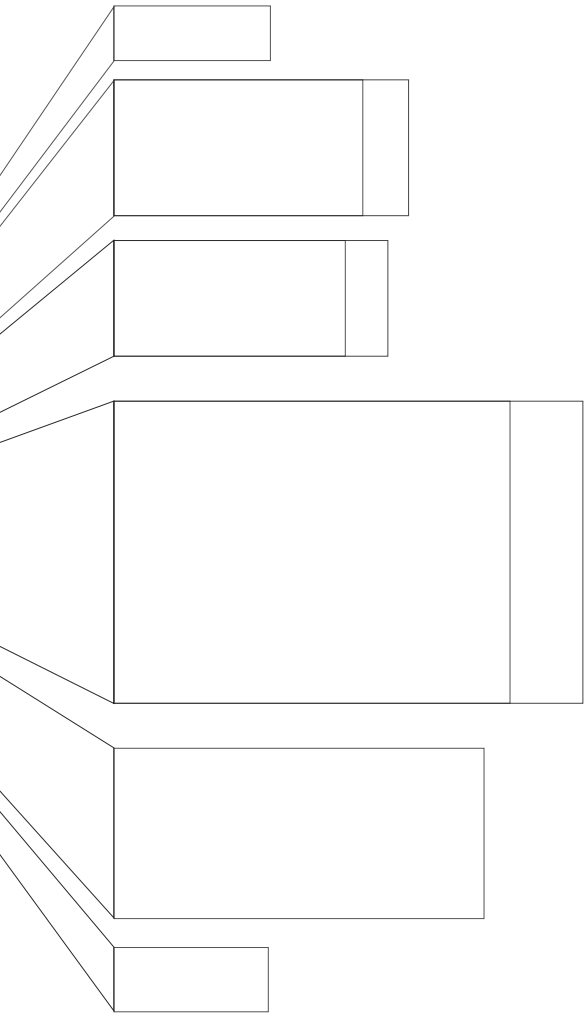

UNITAS GLOBAL

CASE STUDY

GENOMICS INSTITUTE

Leading US Genomics Research Institute Adopts Private Cloud Model

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UNITAS CASE STUDY : GENOMICS

THE CHALLENGE

THE TOTAL AMOUNT OF DATA GENERATED BY GENOMICS RESEARCH DOUBLES EVERY 7 MONTHS – "Big Data: Astronomical or Genomical", Stephens, Lee et al, PLOS Biology

COST OF SEQUENCING BASE PAIRS HAS HALVED EVERY 5 MONTHS SINCE 2005 – The Case for Cloud Computing in Gemone Informatics, Lincoln D Stein

BY 2025 HUMAN GENOME SEQUENCING ALONE WILL HAVE PRODUCED UP TO 40 EXOBYTES OF SENSITIVE DATA – "Big Data: Astronomical or Genomical", Stephens, Lee et al, PLOS Biology

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THE CHALLENGE

RAPID PROGRESS IN GENOME SEQUENCING AND DATA STORAGE TECHNOLOGIES PUT UNITAS' CLIENT IN AN UNTENABLE POSITION. THEIR EXISTING SYSTEMS COULDN'T MEET THE STORAGE OR PROCESSING REQUIREMENTS OF THEIR FIELD, AND TRANSFERRING THE HUGE DATASETS PRODUCED BY GENOMIC RESEARCH WAS SLOW TO THE POINT OF IMPRACTICALITY. THIS SLOWED DOWN DATA ANALYSIS AND HELD BACK POTENTIALLY LIFE-SAVING RESEARCH.

KEY CHALLENGES

- Genomics research produces too much data for legacy systems to store and distribute
- Inefficient use of computing power and data transfer times slow down critical research
- Petabyte-scale database of sensitive genomic data to store, secure, and manage

The prior method for storing and sharing genomics data between researchers, institutions, and companies in this field was based around clusters and grids. To access data in this system, researchers and analysis firms alike had to download and store the data locally, either directly from large central online databases (e.g. the NIH) or from one another.

When that dataset changed, every copy across the internet had to be updated and new versions downloaded by users. Assigning computing capacity for analyzing data involved researchers booking space on a local, shared cluster, which is impractical if you're working with vast reams of genomic data which can take a long time to process.

Clearly this system couldn't keep pace with the data storage and processing requirements of a modern research institute.

Unitas' client also had several petabytes of legacy data to manage, as well as a constant stream of new sequences to analyze. They needed a cloud solution which would help clear the bottlenecks created by the prior system and store their existing data securely, while allowing them to comply with all applicable regulations.

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THE SOLUTION

BECAUSE OF THE POTENTIALLY SENSITIVE NATURE OF GENOMIC DATA AND THE REGULATIONS GOVERNING ITS USE, THE CLIENT CHOSE A PRIVATE CLOUD SOLUTION. UNITAS DESIGNED THIS NEW SYSTEM USING EXISTING HARDWARE AND SOFTWARE TO KEEP COSTS LOW.

Unitas' five-stage methodology ensured a process of both prompt delivery and client satisfaction throughout the project:

DISCOVERY

The Unitas team worked with the client to define project parameters, goals, and budget. Data sharing, computing resource allocation, and data storage emerged as core issues at this stage.

DESIGN

Unitas then designed a bespoke solution to meet the client's needs. This included: a secure private cloud, with access to external databases to facilitate work with other genomics organizations; automated tools and processes enabling the client to scale computing resources with demand; integration of existing genomics data on the client's legacy systems.

DEPLOYMENT

Working closely with Unitas engineers, the client set up and deployed their private cloud solution. Unitas helped test the system and ensure it met compliance standards every step of the way.

MANAGEMENT

In addition to the technical aspect of the solution, Unitas trained the client's IT team to employ a DevOps-style application lifecycle, allowing them to continuously release new applications for researchers to use while still utilizing existing applications.

After training and hand-off, Unitas continued to provide ongoing management for the client's newly-installed systems. Unitas' end-to-end SLA, which not only offers comprehensive support services post-project, but also financial compensation for outages and downtime, was key in ensuring long-term operational excellence, security, and peace of mind for the client.

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UNITAS CASE STUDY: GENOMICS

THE RESULTS

RESULTS

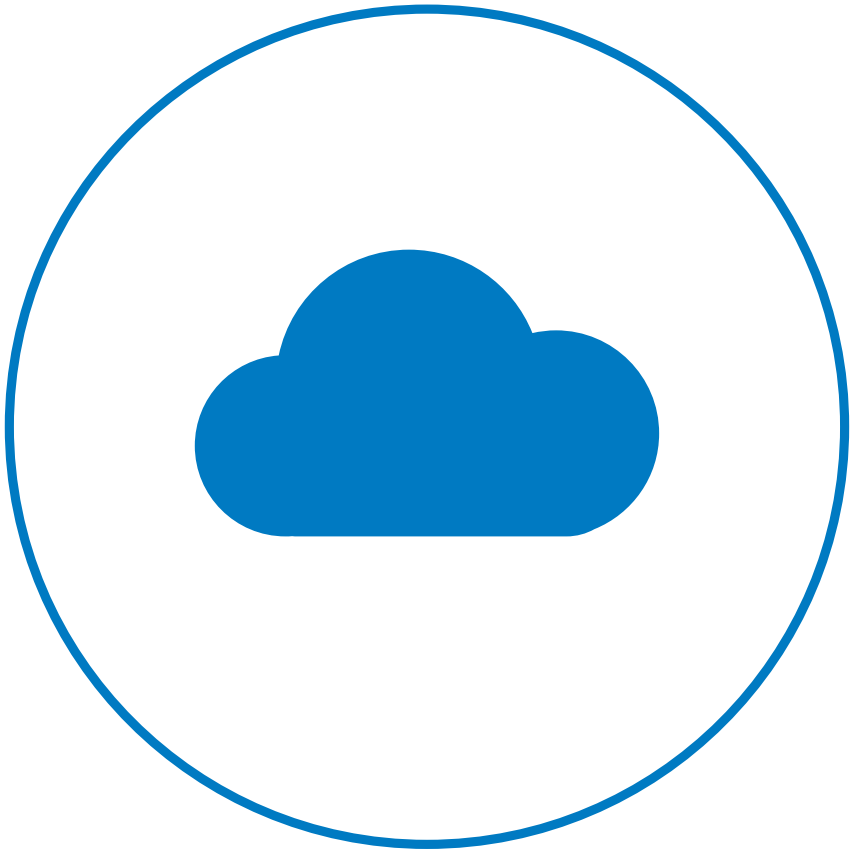
The client was able to implement their private cloud solution and begin running test workloads on it within 3 weeks. After another 3 weeks, the client had finished their first live production workloads and their researchers were able to access the new resources at their disposal. Consequently, the client has dramatically increased their capacity for research and the speed at which it can be done.

Using the automated tools and processes Unitas put in place, the client was able to expand their cloud resources as needed while maintaining tight control over exactly how much they were using. Deployment scripts have enabled researchers to run workloads either in a private cloud or externally, as well as reducing the amount of time-consuming manual coding they have to do on a daily basis.

Additionally, their new cloud systems and updated processes have allowed the client to remain in compliance with regulations governing how personal data is stored, sent, and used. Given the sensitive and private nature of genomic data, this was a key ethical and legal criterion for the client when measuring the success of the project.

BENEFITS DELIVERED:

- **FAST, SECURE ACCESS TO AND ANALYSIS OF RESEARCH DATA IN A PRIVATE CLOUD**
- **IMPROVED COLLABORATION WITH OTHER RESEARCH INSTITUTES**
- **EASY ACCESS TO EXTERNAL DATA**
- **LONG-TERM STORAGE AND REDUNDANCY FOR ALL GENOMIC DATA**
- **FLEXIBLE, AUTOMATED TOOLS TO SCALE CLOUD STORAGE AND COMPUTING CAPACITY AS NEEDED**



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Find out what a hybrid cloud solution looks like for you.

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