

The Server Labs G-Cloud 15 Service Description

G-Cloud 15 Service Definition - AWS
HealthOMICS Implementation Service

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1 Introduction

This document provides you with a description of The Server Labs' HealthOMICS implementation service. AWS HealthOmics is a HIPAA-eligible managed service designed to help healthcare and life science organizations store, query, and analyze genomic, transcriptomic, and other "omics" data at scale. It removes the "undifferentiated heavy lifting" of managing infrastructure for bioinformatics, allowing researchers to focus on scientific discovery rather than server maintenance.

2 Why HealthOMICS

The primary use cases for HealthOMICS are as follows:

- **Clinical Diagnostics:** Building reliable, scalable diagnostic testing workflows with consistent performance.
- **Drug Discovery:** Orchestrating biological foundation models to rapidly iterate through millions of potential therapeutic candidates.
- **Population Genomics:** Analyzing genetic patterns across entire populations to identify disease predispositions and improve precision medicine.
- **Agricultural & Veterinary Research:** Enhancing crop traits such as drought tolerance through AI-powered genomic workflows. Research into veterinary genomics to better understand and manage health conditions in livestock.

HealthOmics is structured into three primary functional areas:

- **Omics Storage:** Optimized for large-scale genomic sequence data (FASTQ, BAM, CRAM) and reference genomes. It features automated tiering (active and archive) to reduce costs for data not accessed within 30 days, offering significant savings over general-purpose storage like Amazon S3.
- **Omics Workflows:** A managed compute environment that automates the orchestration of bioinformatics pipelines. It supports industry-standard workflow languages like **WDL**, **Nextflow**, and **CWL**. Users can run their own "private workflows" or use "Ready2Run" pre-built pipelines for common industry analyses.
- **Omics Analytics:** Simplifies the preparation of genomic data for multi-modal analysis by transforming Variant Call Files (VCF) and annotations into query-ready formats like **Apache Iceberg**. This allows users to query millions of variants using Amazon Athena or train models in Amazon SageMaker.

The key benefits of HealthOMICS are as follows:

- **Massive Scalability:** It can scale to support over **100,000 concurrent vCPUs**, enabling the processing of tens of thousands of samples per day.
- **Predictable Pricing:** Pricing is often based on predictable metrics such as cost-per-sample or gigabases ingested, reducing budget uncertainty for large projects.
- **Security & Compliance:** Built-in features include comprehensive audit trails, data provenance tracking (recording what was run and by whom), and encryption at rest and in transit.
- **Advanced AI Integration:** Recent updates include support for **NVIDIA generative AI blueprints** and foundational models to streamline drug discovery tasks like virtual screening.

For further information on HealthOMICS, please refer to the AWS website, or email sales@theserverlabs.com

3 TSL HealthOMICS Implementation Service

TSL have implemented OMICS in a Bioinformatics environment and as such are one of the few consulting organisations with a track record of success implementing this platform. The TSL OMICS service includes the following activities:

- Conduct technical analysis of As-Is AWS environment and Target environment requirements.
- Develop and execute a detailed integration plan. This typically follow an AWS MAP assess, migrate and modernise program including configuration and testing of target environment.
- Ensure the proper permissions and access controls are in place for accurate benchmarking.
- Monitor system performance metrics to identify bottlenecks.
- Implement performance tuning and optimisation strategies to enhance system efficiency and throughput.
- Compile detailed documentation of benchmarking processes, results, and analysis.
- Prepare comprehensive presentations for stakeholders, highlighting key findings and recommendations.
- Engage with partners to discuss best practices for OMICS setup.
- Analyse usage patterns of AWS instances using various metrics and develop documentation with recommendations, for the best setup of instances based on usage data.
- Assess costs associated with implementing Bioinformatics platforms on OMICS.
- Create a detailed cost analysis document outlining implementation expenses and potential savings.
- Review and optimise security operations and pipeline processes for container builds used in OMICS.
- Identify and address security vulnerabilities and enhance overall system security.

- Build containers and pipelines using DevSecOps tooling to enforce best practices and catch errors early in the development lifecycle.
- Apply a Shift Left methodology, integrating security measures early in the pipeline to pre-emptively address potential security risks and ensure compliance with best practices.

For further information on the TSL HealthOMICS implementation service, please email sales@theserverlabs.com

4 The Server Labs

The Server Labs (TSL) is a 100% privately founded IT Consultancy and Software Development Company with headquarters in the UK and offices in Germany and Spain and now established as a leader in Cloud Computing services. The Server Labs focuses on the design and implementation of IT architectures and advanced software engineering projects working with the most advanced technologies to provide its clients cost-effective, scalable and high performance solutions. The Server Labs has been using the Cloud since 2006 and working with its customers in the cloud since 2008 and was one of the first European partner's of Amazon Web Services.

The Server Labs has clients in many different industry areas such as space, finance and telecoms. We collaborate with our clients to obtain success, committed to innovation, enjoying what we do every day and growing with every challenge.

The Company's mission is:

- To provide **expert services** in the field of IT architectures and advanced software engineering
- To **improve radically the software development process**
- To help organisations achieve better business results through the correct use of latest technologies
- To have **100% satisfied clients**
- To create high quality **innovative software solutions**, providing added value to our customers

The specific value, experience and expertise that The Server Labs can provide for e-LfH are:

1. **Technical excellence** and capability to act as lead on architectural decisions and as technology expert in software and system subjects.
2. **Architecture experience at software and system level.**
3. **Proven experience in HPC and Big Data Projects**
4. **Real cloud computing experience, at IaaS, PaaS and SaaS levels, and for both compute power as well as storage solutions in different clouds.**

5. **Software systems developed all follow ISO 27001 certified secure development methodologies**
6. **Technological excellence**, especially in the main technologies required for the project, including HPC, web services and security technologies.

All our architects and engineers are experts with an average of 10 years' experience in the planning, design and development of complex software systems. Our multinational team has been a pioneer in Java technologies, Object Oriented Analysis and Design and distributed architectures, and has the required hands-on experience in many state of the art technologies. In the last few years, The Server Labs has positioned itself as a leader in Cloud computing services, helping organisations move to the Cloud at all levels. For more information on current projects being undertaken by The Server Labs in Cloud computing, please see Appendix B.

Our experience working across several industries has given us a good understanding of the different requirements so we are able to provide the solution that best suits each particular business and reuse the lessons learnt in the other industry sectors when applicable. Our clients span organisations such as Bioinformatics (Genomics England & NIHR Bioresource), Central Government (Home Office, DEFRA, OFCOM, NICE), Banks (BNP Paribas, BBVA, Caja Madrid) , the European Space Agency (ESA), Madrid Underground (Metro de Madrid), ICCAT, Amadeus, TRAGSA, TIBCO (a leader in Messaging and Service Bus architecture systems), O2 and Telefonica, Vodafone, ORACLE, several, Sun Microsystems, TUI and Marsans travel, etc.