OHDSI Technical Reference Architecture on Amazon Web Services

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Background

OHDSI's Vision : A world in which observational research produces a comprehensive understanding of health and disease.

One of the challenges often faced when working with mammoth Healthcare Big data tools is the expense & time required to run them. Other challenges are: Scalability, Flexibility & Use of Use. Amazon Web Services has enabled us to address many of the classic IT challenges by making enterprise class infrastructure and technology available in an affordable, elastic, and automated way.

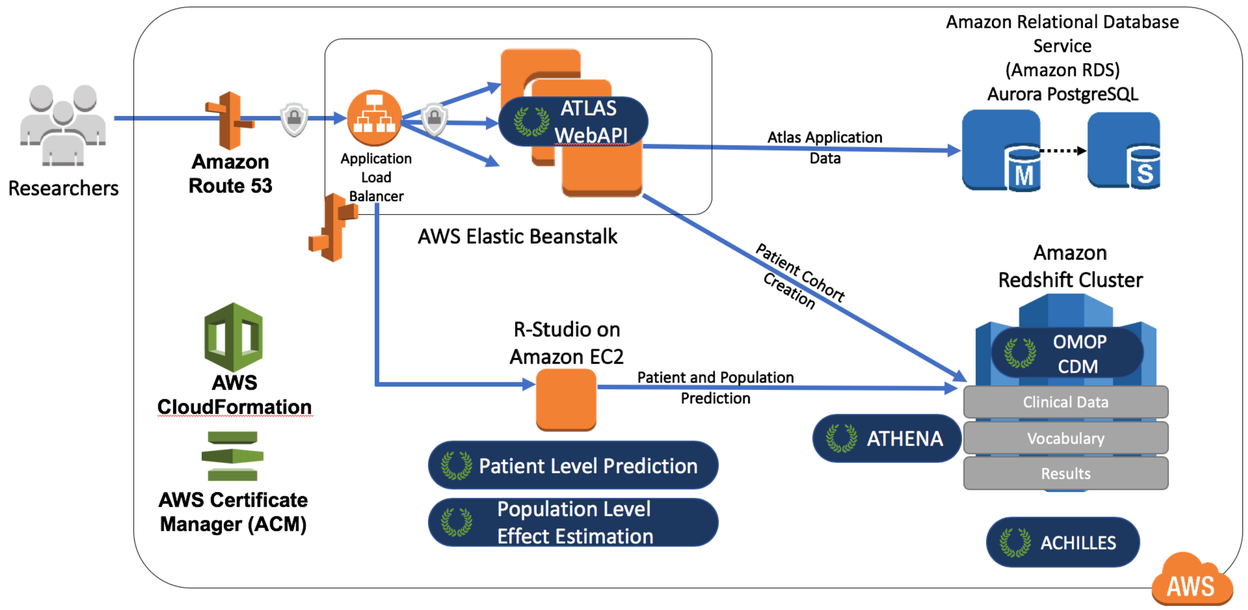
Automation has been created to deploy a full-featured, flexible **OHDSI environment on AWS** with the following features:

- Deployed in an Isolated, three-tier Amazon Virtual Private Cloud (Amazon VPC).
- Deploys the OMOP CDM with clinical and vocabulary data, Atlas, WebAPI, Achilles, and RStudio with Patient Level Prediction, Cohort Method, and many other R libraries.
- Uses **data-at-rest and data-in-transit** encryption to respect the requirements of HIPAA.
- Leverages AWS **Managed Services** stacks to reduce burden on the Organization
- In-built automated backups for operational and disaster recovery.
- Environments can be configured from very small to peta-byte scale, geographically redundant implementations
- Build the entire environment & launch the Applications in few hours than month
- Manage, Transform, Analyze and Visualize healthcare data in a cost-effective way

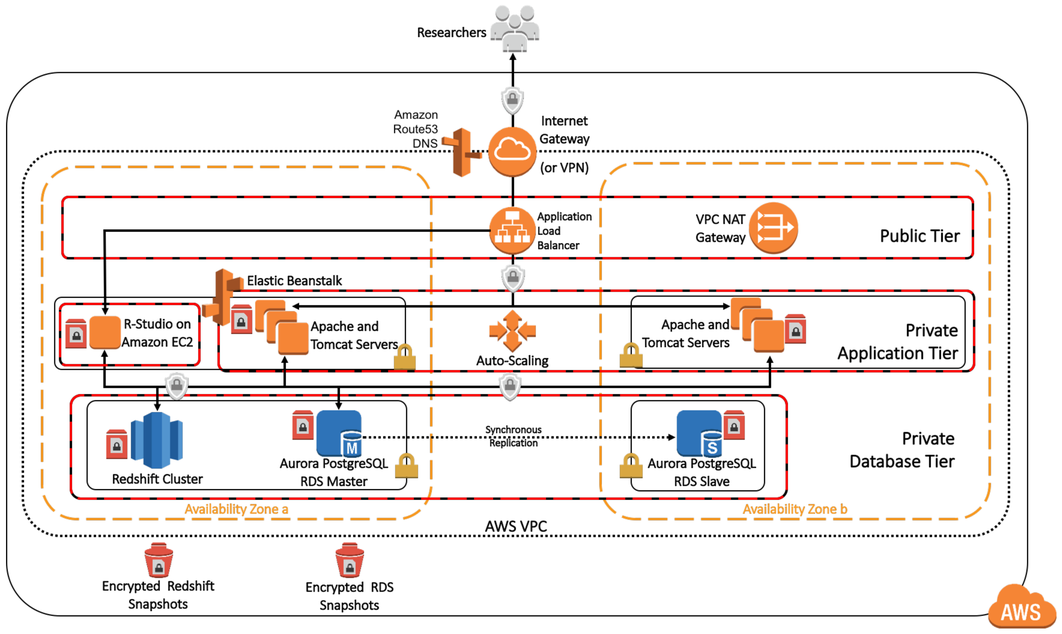
Methodology

AWS **CloudFormation**, an infrastructure-as-code automation tool, is used to deploy the OHDSI environment in just few hours and has the flexibility of parameterizing to deploy a customized environment. This CloudFormation template is provided to the community under the Apache 2.0 license and could also be modified to suit other needs.

Below is a block diagram that shows the overall architecture and mapping of the various OHDSI projects to the AWS Services used. An arbitrary number of OMOP formatted data sources can be specified and they will automatically be loaded in to the Amazon Redshift data warehouse and a results schema will be populated for each by Achilles.



Reference Architecture for OHDSI on AWS



Key Benefits of Using AWS for OHDSI

Accelerated Time to Insight

Improved Patient Outcomes

Scalability and Dynamic Resourcing

Pay As You Go Model

Data Privacy and Encryption

Compliant and Secure Environment (HIPAA/PII/PHI etc)

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