Cloud-based, Automated Solution for Transforming Clinical Datasets to the OMOP CDM

Simon Thompson & Abigail Carter
Genomics England

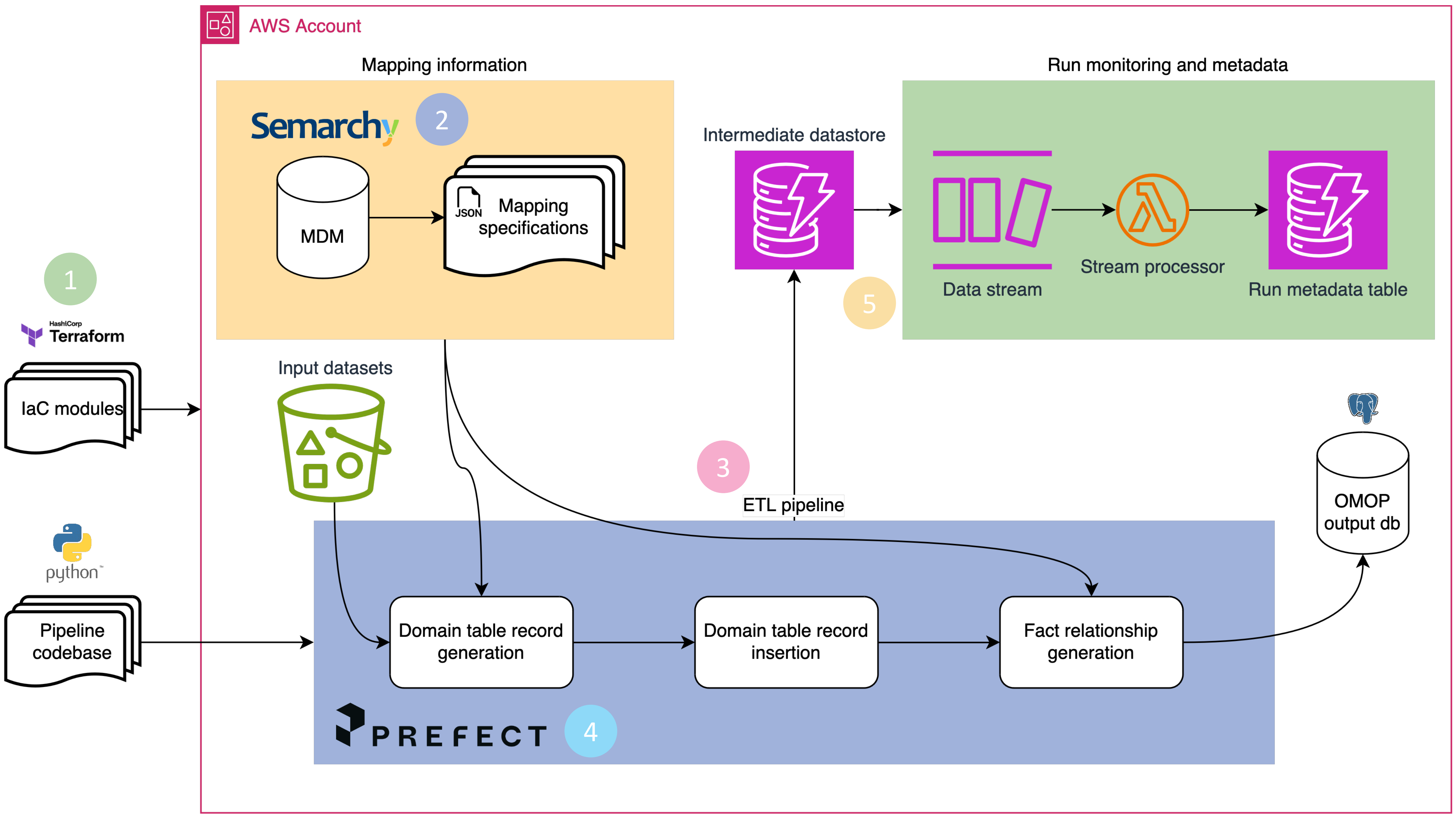
BACKGROUND

Genomics England is a public-funded body that partners with the NHS to provide whole genome sequencing diagnostics and equip researchers with a large genomic database, the National Genomic Research Library (NGRL). The NGRL holds clinical data on over 100,000 patients. The information is currently held in separate data models without standardised concepts or enumerations. There is a desire to transform as much of this diverse dataset as possible to the OMOP CDM.

PIPELINE REQUIREMENTS

The pipeline should:

- be cloud-based (in AWS) in its entirety and use serverless technology where appropriate,
- be high-throughput and process data in parallel,
- store mapping information in a format that is easily interrogated and updated,
- be secure, have a high level of testing and monitoring, and capture failing records at runtime.



SOLUTION

1 Infrastructure is deployed using Terraform (an infrastructure-as-code tool).

2 Mapping information for all datasets and concepts is stored in a Master Data Management (MDM) platform, Semarchy (see poster by Carter et al. for further information).

3 Individual pipeline components (written in Python) for generating OMOP domain table records, generating fact relationship records, and inserting records into a database, are generic and parametised by the MDM platform.

4 Prefect orchestrates the pipeline and manages the parallel execution of processes.

5 Dynamodb, a serverless NoSQL database, is used as an intermediate datastore and feeds processes that monitor each pipeline run. Data is encrypted at rest and in transit throughout.

Simon Thompson
Data Engineer – Research Data Products Squad
simon.thompson@genomicsengland.co.uk

Abigail Carter
Data Wrangler – Research Data Layer Squad
abigail.carter@genomicsengland.co.uk