



P1 Technologies

Boots in the Cloud



MISSION

To develop and commercialize disease-specific and targeted multi-cancer epigenomic tests for early cancer detection.



HISTORY

Inspired by patients and the discovery of a unique 5-hydroxymethylcytosine (5hmC) biomarker, ClearNote Health was founded out of the Stanford laboratory of Steve Quake, D.Phil, to develop non-invasive epigenomic tests to detect cancer through a standard blood draw earlier than existing methods and when the disease is still treatable.



PEOPLE

With locations in San Diego and the San Francisco Bay Area, our collaborators include scientists and technologists at the regions' top research institutions, as well as multiple Fortune 500 pharmaceutical companies.

ClearNote Health Teams with P1 Technologies to Lay the Foundation for a Scalable Epigenomic Platform

ClearNote Health is spearheading the development and commercialization of epigenomic non-invasive cancer tests to detect the deadliest cancers earlier than existing methods. Starting with pancreatic cancer, their aim with these tests is to detect the disease early when therapies are most effective.

ClearNote's Avantect platform takes a unique epigenomics approach that provides unprecedented precision in cancer detection. They're partnering with clinicians who can administer these tests to their patients. With this precision and clinical application, they knew that their platform would have to scale. Naturally, they turned to AWS.

Scalability was not their only design principle however. Their platform had to be secure but flexible. They had to be able to iterate quickly and maintain compliance every step of the way. The decision to deploy Infrastructure as Code (IaC) was obvious, but the exact approach was not. ClearNote Health turned to P1 Technologies to help refine their approach and implement it.



THE CHALLENGES

- Build for scale without compromising flexibility or security
- Improve developer velocity without sacrificing security
- Iterate quickly and with confidence



RESULTS

- Developer friendly, cloud-independent workflow
- Modular design for more scalable infrastructure
- Secure pipelines that meet standards set by federal regulators



Start with Structure

ClearNote and PI initially focused on the structure of their AWS accounts and code repositories. Stateless resources and critical assets could not be commingled in an account. Persistent data and critical software artifacts were safely isolated, protected, and least privileged access was applied. This design opened the door to a variety deployment and redeployment options. The entire platform could now be built from the ground up with minimal effort.

The same was true of code repositories. Altering their structure led to a more efficient and flexible release process. Infrastructure and pipeline code was decoupled and broken down into smaller, specific components. Each could now be updated independently and without potential downstream impact. Test functions were introduced for improved reliability and automated triggers were added in Codepipeline and Codebuild for continuous delivery.

Simplify and Optimize

Once the new structure was in place, all IaC was refactored using Terraform. Remote state was stored in S3 and locking was enabled using DynamoDB.

Refactoring created an opportunity to eliminate unnecessary restrictions on internal network traffic, remove default resources, and create an operating environment that would be easy to assimilate and manage. The learning curve for new developers was flattened, another important step towards greater scalability.

Refactoring and restructuring also created future cost savings opportunities. Upgrading to the latest generation, most cost effective resources is simply a matter of redeployment. Most importantly, ClearNote was able to re-baseline their spend, a critical step in pursuing AWS private pricing.

Platforms & Services



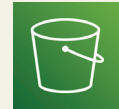
Containers
Docker



Infrastructure of Code
Terraform



DynamoDB
AWS



Simple Storage Service
AWS



Storage Gateway
AWS



CodePipeline
AWS



CodeDeploy
AWS



PI Technologies is an innovative consulting team of enterprise architects with deep cloud expertise. We're focused on simplifying and automating workloads, so that our customers can focus on their business goals.



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