

Developing Risk Assessment Applications at the FDA using AWS (Amazon Web Services)

Hong Yang¹, Yin Huang¹, Richard Forshee¹, Mark Walderhaug¹, Jason Claeys¹, Rebecca Kahn², Leslie Eberhardt², Guangfan Zhang²

Introduction

BRisk (Blood Risk Tool) and GREAT (Geographic Risk Evaluation and Assessment Tool) have been developed as desktop applications to help the FDA Center for Biologics Evaluation and Research (CBER) Office of Biostatistics and Epidemiology (OBE) evaluate and respond quickly to emerging diseases that may impact the U.S. blood supply. Both tools are in the process of being rearchitected and deployed as web applications that will take advantage of the flexibility, scalability and high availability provided by Amazon Web Services (AWS).

The architecture of the two tools are shown in *Figure 1*.

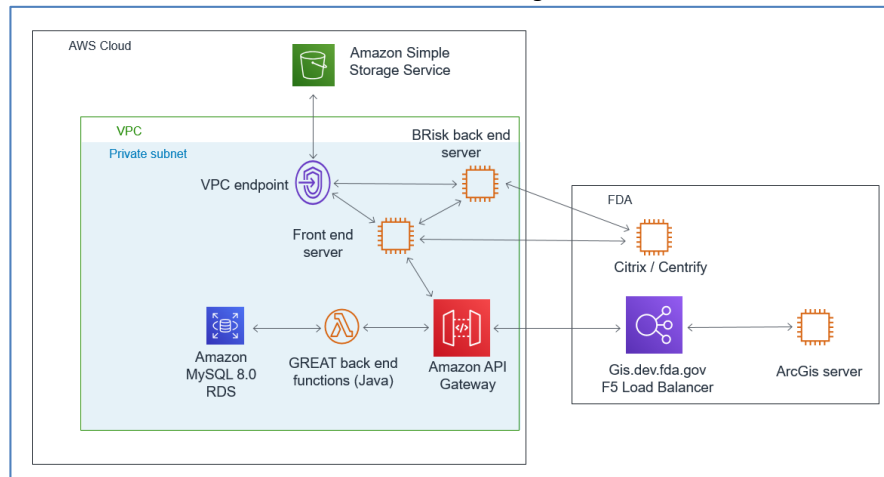


Figure 1: BRisk and GREAT full web application architecture

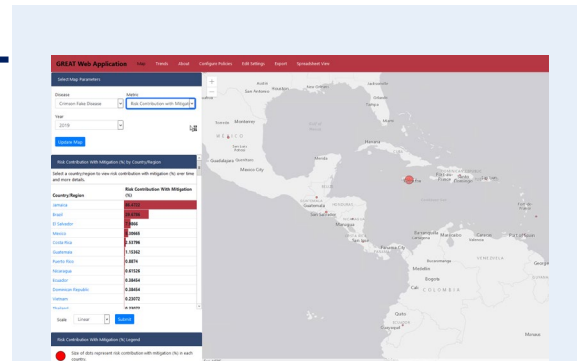


Figure 2: Risk Contribution Map in GREAT

BRisk and GREAT are architected for AWS and provide flexible risk assessment.



Figure 3: Model Results in BRisk

Steps for Deploying a Web Application on AWS at the FDA

1. Prepare an initial architecture for your application and a target state diagram
2. Discuss your architecture with your center's ISSO
3. Discuss your architecture with your center's client advocate and tech lead
4. Submit a provisioning request through RQST-IT, including a cost quote created using Amazon's monthly cost calculator
5. Once your services are provisioned, open Change Requests to create Security Groups and IAM roles to ensure resources can communicate with each other
6. Submit any necessary firewall access requests
7. Submit RBAC to gain access to resources using ALT PIV card
8. Use Amazon CLI on EC2 instances to configure EC2 or push files to S3
9. Continue to submit Change Requests to make additional changes

Tips

- Use the AWS command line interface on EC2 to interact with your services programmatically
- The OIMT IT Lab's sandbox can be used to develop applications using technologies that are not yet on the MAT List
- AWS SAM Local can be used to develop serverless applications on the OIMT sandbox

Conclusions

- AWS provides flexibility, high availability and scalability for deploying web applications
- The BRisk and GREAT applications are planned to move to the FDA development environment soon

Affiliations

1. U.S. Food and Drug Administration, Center for Biologics Evaluation and Research, Office of Epidemiology and Biostatistics
2. Scientific Applications International Corporation (SAIC)

Disclaimer: The views expressed in the article are those of the authors and may not reflect the views of the FDA.

Interaction Experience: Design an Architecture

[Let's choose which services to use to architect the major parts of an application on AWS and see which were chosen for use in GREAT and why.](#)