



Executive Summary

Healthcare providers are seeing the value of the public cloud and are making the move to AWS. The flexibility, security, reliability, and reduced operating costs. The pace of innovation of the public cloud is unmatched as well.

Healthcare providers' traditional system integrators and partners are not as cloud savvy as they may claim. Emerge is a unique healthcare organization because it offers solutions regarding unlocking hidden patient data.

The Challenge

The challenge was multi-faceted: One of our clients in the healthcare industry, Emerge needed a well architected review after being in AWS for over a year, while seeing many changes and updates to their environment due to their software development lifecycle and amount of change entering their AWS environment. They wanted to look at the 5 pillars that include Operational Excellence, Security, Reliability, Performance Efficiency and Cost Optimization. Security and Cost Optimization was the immediate priority, while ensuring they were following HIPAA compliance best practices in AWS.

There was a second significant challenge, too: HIPAA compliance. HIPAA, or the Health Insurance Portability and Accountability Act, has been U.S. law since 1996. The most important section of this act is Title II, which sets the standards for digital healthcare data access and transfers while remaining in compliance with privacy regulations set by the U.S. Department of Health and Human Services.

The third deliverable was ensuring cost containment, optimization and operational readiness. Emerge needed additional increased reliability,

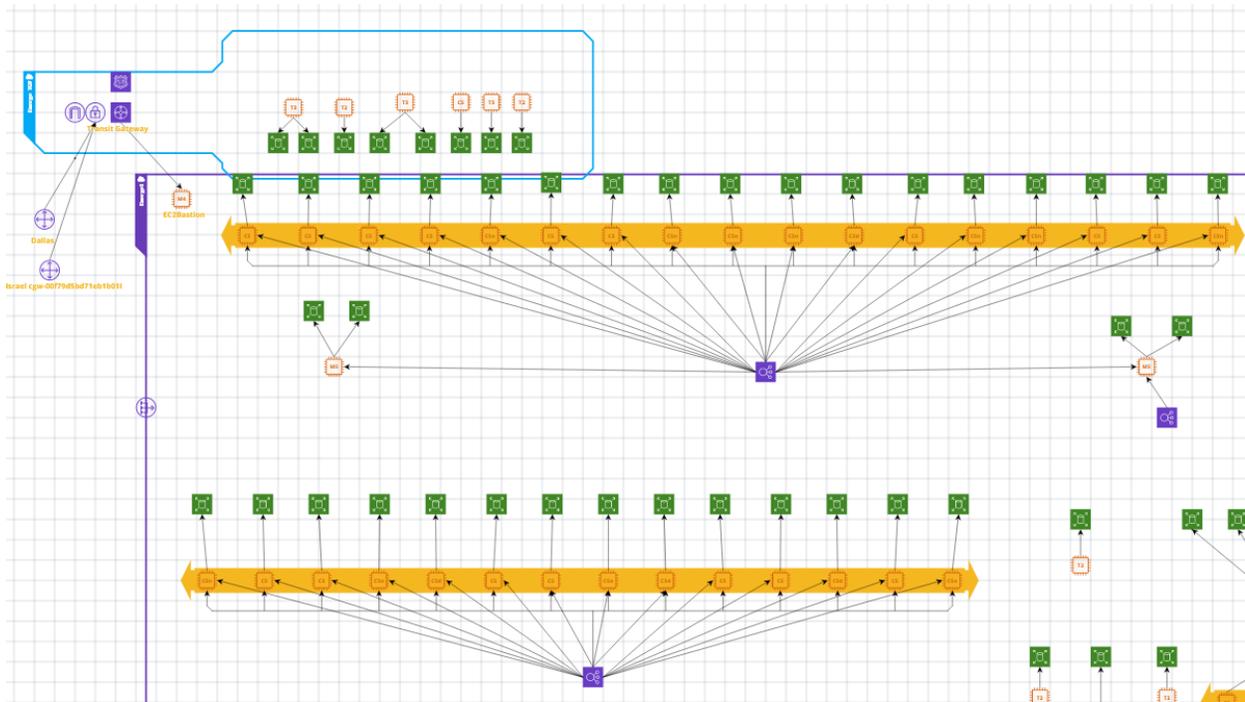
uptime and scalability while addressing the legal regulations of the healthcare industry. To keep the cost of this project affordable, eCloud provides the available services needed to be selected and implement the remediation needed.

eCloud Approach

To ensure we met all stated objectives, eCloud Managed Solutions organized a plan that we implemented over a 8-week period. We started with the Well Architected Review to baseline their existing environment. With regards to security, we found that their were 60 EC2 instances without an IAM profile attached and S3 buckets that didn't have default encryption enabled. We also identified that AWSConfig and CloudTrail were not enabled. A stated goal was increase uptime, we identified they were only in a single Availability Zone, no backups scheduled and only having a single load balancer.

Remediation

The first and most important step we aligned with the Emerge team out of Well Architected Review was shoring up their security. We encrypted the unencrypted S3 buckets with their team, while also defining an IAM role for their EC2 instances, and attaching the EC2 instances that didn't have an IAM profile attached.



Also in order to meet the HIPAA compliance standards we needed to make sure all data was encrypted in transit and at rest along with a preferred Intrusion Detection System (IDS). Amazon EBS (Elastic Block Storage) with encryption enabled was the perfect fit to meet the encryption at rest. Then forcing SSL encryption for all internal and external communications between the applications and database, this would satisfy the encryption in-transit requirement.

Fortinet Firewall, Route53, CloudWatch and CloudTrail

To help ensure mission critical application increased availability, we configured a multi-AZ approach with application load balancing (ALB) across two AZs leveraging Route53. To monitor uptime and security requirements and prevent attacks and intrusions, we re-configured a combination of their Amazon WAF, CloudWatch and enabled CloudTrail. CloudWatch ensures that all functions of an application run quickly and smoothly. WAF security rules were put in place to provide control over which web application traffic to allow to each application. If there's ever a need to scale up, CloudWatch logs events and sends alerts so that additional resources can be dedicated to the application. CloudTrail, on the other hand, monitors the back end of the application, ensuring governance,

compliance, and operational and risk auditing services are all being performed, which wasn't enabled. While CloudWatch looks at application demands, CloudTrail notes AWS account activity, including changes to the Management Console, SDKs, and command line tools. Together, these services ensure this client now has automated eyes on their application security and performance.

AWS Cost Optimization

Once all of the remediation steps were deployed and tested, we implemented cloud storage policies to leverage cost optimization best practices, continuous evaluation and EC2 right sizing. We built rules for S3, Infrequent S3 and Glacier to lower costs, and a backup solution driven by compliance and our well architected review framework and findings.

Final Result and Benefits

With eCloud Managed Solution's guidance and direction, Emerge was able to increase application uptime availability, security and cost optimization improvements they were looking for. Since remediation, they've seen all the cost savings they expected as well as shoring up their security posture they hoped for. Thanks to our dedicated Architecture team that follows the AWS Well Architected Framework and the flexibility of AWS Platform, eCloud Managed Solutions was able to remediate Emerge's environment to increase availability of their environment that is cost effective, along with aligning to the HIPAA compliant framework. Emerge has employed eCloud Managed Solutions for continuous cost optimization and security monitoring.