

StayWell Achieves Migration and Automation Goals with the Help of ClearScale



Executive Summary

StayWell is a health engagement company that helps improve health, business results — and lives — through education. The company works across the healthcare industry to custom-design holistic solutions that motivate workforces and address every organization's evolving needs. Its customizable programs effectively engage people to make positive healthcare decisions—even across the most challenging populations.

Leveraging decades of experience and expertise in health engagement and the science of behavior change, StayWell offers an integrated portfolio of solutions and robust content assets. The company leads the industry in research and technology to stay ahead of the latest trends in health and wellness — while always putting people first.

"Great ideas abound in most organizations. ClearScale provided the depth, breadth, and experience to validate and guide our great ideas. Our work with ClearScale delivered the future-state design architecture that we were looking for. Their range of expertise enabled us to create a clear direction for our technology deployments that extend globally when necessary. I was impressed with the effort, going "above and beyond," so that we have ALL of the reasons and parameters necessary to not just deliver a new architecture, but to believe in it as well."

Bill Fetters, Vice President, Information Systems

The Challenges

StayWell faced not one challenge, but two. First, the company was closing one of its on-premises data centers in a little over a month, and needed plans, tools, and procedures to [migrate infrastructure components, data, and applications](#). StayWell's services, including hundreds of virtual machines with applications, Oracle databases, and Microsoft SQL databases, had to be migrated to [Amazon Web Services \(AWS\)](#) workloads as soon as possible.

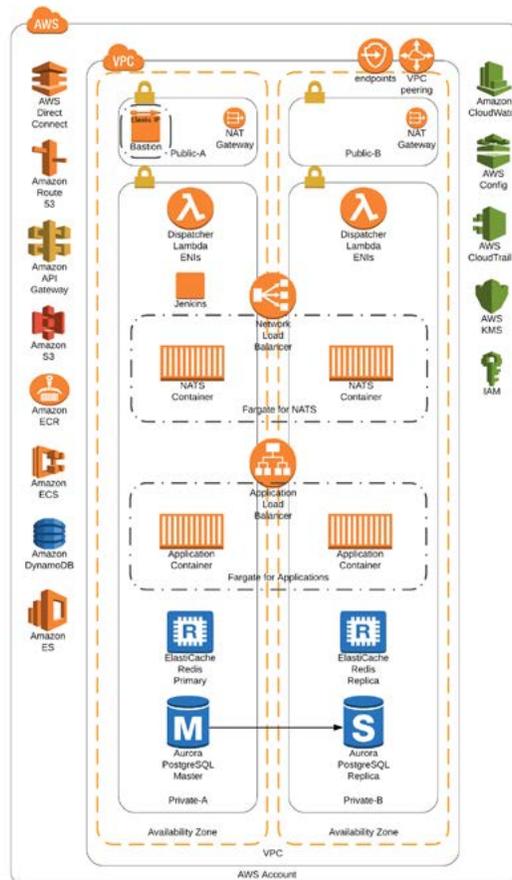
The second challenge was an upcoming [automation project](#). To support its continued growth, StayWell had decided to build a new microservices platform. The goal was to provide stable, fault tolerant, and performant building blocks for existing and new applications. The company chose a containerization strategy that would allow it to abstract away from underlying infrastructure, support greater modularity and flexibility, and facilitate provisioning, deployment, and management. Main trade-off for microservices architecture was complexity. Managed services, complete automation of infrastructure provisioning, and application delivery were therefore fundamental.

To deliver these two time-sensitive, complex projects, StayWell approached ClearScale, an AWS Premier Consulting Partner.

The ClearScale Solution

As a preliminary step, the ClearScale team worked with StayWell to gather requirements for the migration, evaluating the company’s existing cloud-based architecture and modified networking architecture. ClearScale then suggested that a lift-and-shift migration would be best due to the time pressures. Applying general principles as well as specific best practices, ClearScale designed a secure, reliable, and cost-effective architecture on AWS.

Migration Diagram



The team leveraged the AWS Server Migration Service for the server migration. Backup/restore (full and differential backups) process was chosen for the databases migration.

Thanks to ClearScale's methodology, all applications and data were migrated consistently, with minimal impact to StayWell's services. ClearScale assisted StayWell with post-migration problem remediation as well.

While facilitating the migration, the ClearScale team started in on the automation project, which was to be designed and built following best practices for HIPAA-eligible architecture in the cloud. The project entailed complete automation of infrastructure provisioning and application delivery.

AWS Elastic Container Service (ECS) with the Fargate launch engine was chosen as a key element of the new microservices platform, to deploy, configure, and scale all applications. The fully managed Amazon Elastic Container Registry (ECR) was used to store and manage container images, while an Amazon Application Load Balancer routed traffic to services.

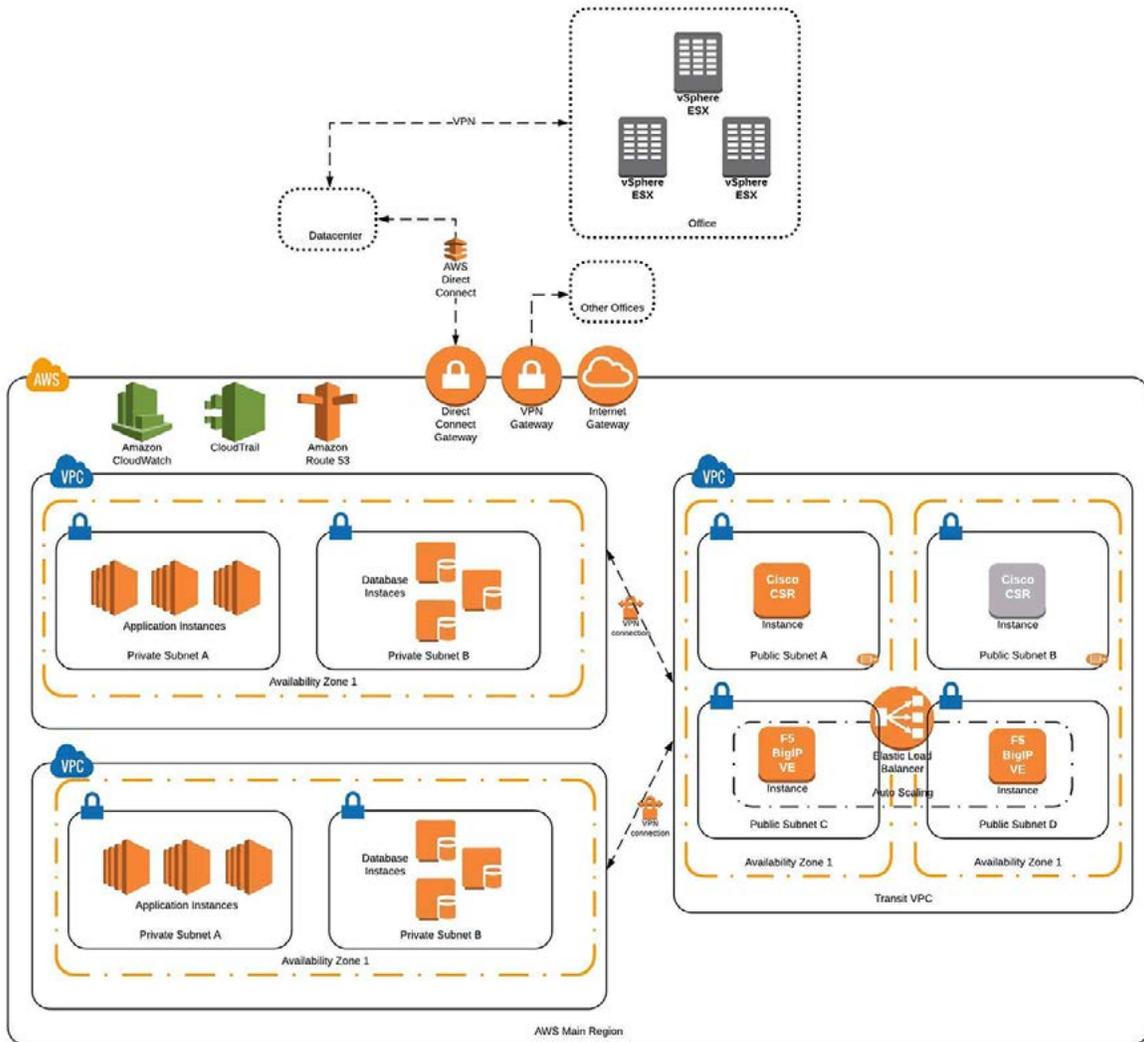
The new microservices platform's infrastructure components include NATS cloud native messaging system for service discovery. NATS is deployed to independent Amazon ECS cluster with Network Load Balancer.

ClearScale also deployed Amazon API Gateway, which allows StayWell to develop thin, single-purposed, language-agnostic services. The Amazon API Gateway Lambda authorizer controlled access to each API through a bearer token authentication strategy.

Amazon Elasticsearch Service was used to deploy, operate, and scale Elasticsearch clusters in the AWS Cloud. It was augmented by Amazon ElastiCache Redis, which provides in-memory caching of search results.

Amazon DynamoDB replaced MongoDB as the primary datastore for all new services. The Amazon Aurora relational database engine with PostgreSQL engine was used for all services designed to work with the relational database management system.

Automation Diagram



To safely, predictably, and efficiently build and change the infrastructure, ClearScale developed multiple Terraform modules and configurations, including implementing one-click infrastructure deployment using the Jenkins open-source automation server with a Jenkins Pipeline functionality to allow StayWell to create and destroy AWS resources, managed by Terraform.

ClearScale also built a unified, automated end-to-end continuous integration and continuous delivery (CI/CD) pipeline, leveraging Jenkins as an orchestration tool.

To further reduce operational costs and quickly deploy Lambda functions and API Gateways, ClearScale used a serverless framework, which also managed Canary deployment on Lambda. Blue/green deployment was implemented for Amazon Elastic Container Service (ECS)-based services to reduce downtime and risk leveraging the Amazon Route 53 weighted routing policy.

Finally, ClearScale designed the monitoring and alerting strategy, leveraging Amazon CloudWatch to monitor AWS resources and applications in real time, collect and track various metrics, and send notifications. The team also deployed a broad range of security services and measures.

The Benefits

The StayWell migration was a complete success. ClearScale migrated hundreds of client systems, including Windows-based systems, Linux-based systems, and Microsoft SQL databases, to the AWS Cloud, while decommissioning some legacy systems as well. Using the AWS SMS enabled ClearScale to migrate these systems in parallel with up to 100 concurrent syncs, and resulted in a 200% faster migration.

Thanks to the migration, network complexity was dramatically simplified from 80 VLANs spread between nine StayWell domains to 36 VLANs. In addition, the AWS SMS allowed ClearScale to migrate these VLANs completely intact, without name or IP changes, which was extremely important due to the fact that so many were legacy systems.

Given that the migration had to take place in one month, cost savings were not the primary goal. However, in future phases, StayWell will leverage AWS managed services, such as Amazon Relational Database Service (RDS), to consolidate databases and reduce costs.

The automation project went equally well. StayWell now has a new microservices platform that supports horizontal auto-scaling, to handle increased loads whenever they occur. The platform's loosely coupled, distributed architecture allows each portion to be scaled independently, for managing hundreds of services with greater granularity.

With their new, HIPAA compliant, highly available platform and automation tools, StayWell can build and run more highly secure and reliable applications, and not worry about the underlying infrastructure.