Spire Health

Ibexlabs

aws certified
AWS PARTNER NETWORK

Key Facts

Spire Health specializes in continuous respiration sensing and high-adherence, patient-friendly ambulatory monitoring. Its mission is to harness the power of algorithms and sensors to improve health outcomes by empowering patients and physicians with useful and actionable data. Currently, they work with partners across a range of health conditions, including chronic obstructive pulmonary disease (COPD), congestive heart failure, asthma, sleep disorders, and anxiety.

spire

Project Dates

AUGUST 2019 →
DECEMBER 2019

Challenge

As part of our initial discussion with Spire, Ibexlabs identified a few key challenges that would make a major difference for the company as part of their IT day-to-day operations. The first of these core issues included helping to set up next-generation monitoring solutions to improve the company's end to end application and infrastructure.

In addition, Spire's wanted Ibexlabs to ensure its infrastructure is set up with best practices and optimized for all 5 Pillars of AWS Well-Architected Framework. The Well-Architected Review helps Ibexlabs support our customers by providing actionable insights into their environment's security, reliability, and performance, as well as their cloud operations and return on cloud spend. By reviewing Spire's environments, Ibexlabs could leverage the AWS Well-Architected Framework to build the company the most secure, high-performing, resilient, and efficient infrastructure possible for their workloads.

Predominantly though, Spire needed comprehensive and continuous compliance across all its cloud environments to be fully compliant with HIPAA regulations. Maintaining continuous compliance involves setting up a documented process for monitoring, maintenance, patching, and encryption. Extensive due diligence such as this that is required by tackling HIPAA compliance can feel burdensome and impossible, as it takes away from a company's precious hours and resources. Ibexlabs was there to help the company work through the technical portion of the HIPAA Risk Assessment and establish best practice protocols for protecting electronic data.
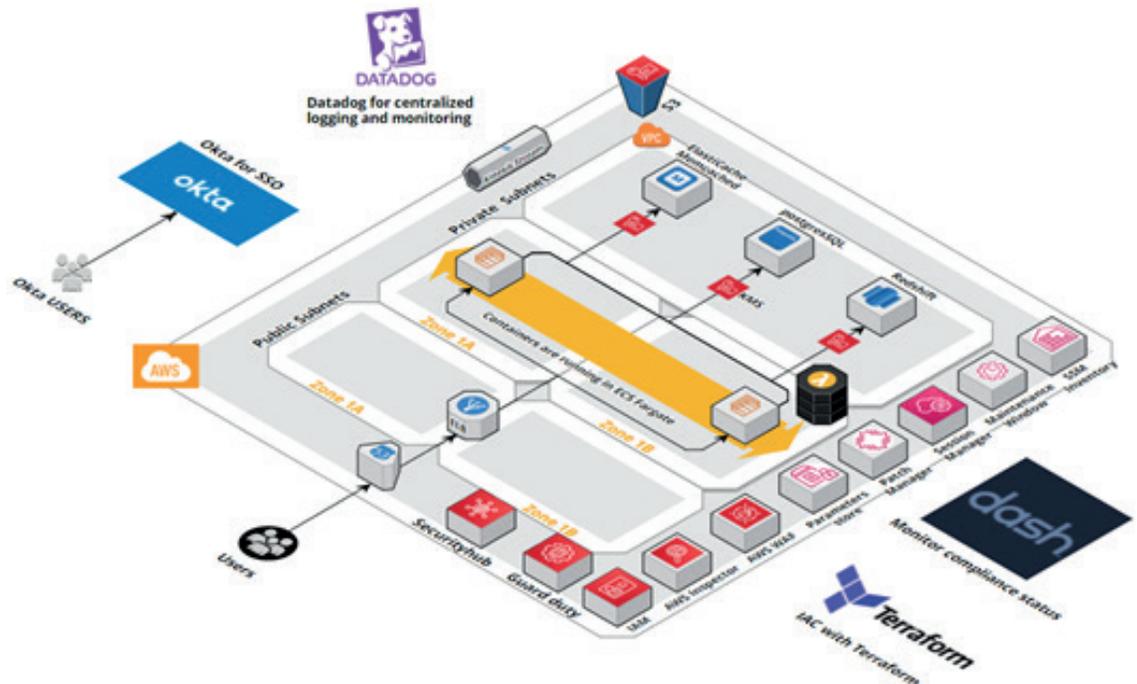
COPYRIGHT © 2020 IBEXLABS / **Spire Health** · Case Study
www.ibexlabs.com

116 Village Blvd, Suite 200, Princeton NJ 08540
#303, New Mark House, Hitech City Rd, Patrika Nagar, HITEC City, Hyderabad, Telangana 500081, India

The Ibexlabs Solution

AWS Services Used

Amazon Virtual Private Cloud (VPC)	AWS (IAM)	Elastic Container Service
AWS CloudTrail	SecurityHub	Elastic Container Register
AWS Systems Manager	Amazon GuardDuty	RDS

AWS Systems Manager:
- SSM Session Manager
- SSM Patch Manager
- SSM Maintenance Window
- SSM Parameter store
- SSM Inventory

AWS Config and Config Rules	Amazon S3

Third-Party Services

DataDog	Terraform	DashSDK
DataDog	CircleCI	

Architecture Diagrams of the specific customer deployment

COPYRIGHT © 2020 IBEXLABS / **Spire Health** · Case Study
www.ibexlabs.com

116 Village Blvd, Suite 200, Princeton NJ 08540
#303, New Mark House, Hitech City Rd, Patrika Nagar, HITEC City, Hyderabad, Telangana 500081, India

How the solution was deployed to meet the challenge

DevOps engineers at Ibexlabs reviewed and analyzed the client's requirement where the need was to orchestrate the infrastructure within a few minutes and that also should be cloud agnostic. Engineers at Ibexlbs used Terraform to codify the provisioning of infrastructure onto the public cloud and enabled this provisioning to these clouds through automation. By automating manual configurations, we also eliminated the possibility of human error.

The solution provided by Ibexlabs also took care of the database backup for the situation when the infrastructure is destroyed – automated backup of the database would be kicked off in that scenario.

Not only infra but Ibexlabs also automated the application deployment process by integrating with CircleCI to improve software development and to accelerate the software delivery. As a result, the client's application could be brought up within no time and without human intervention.

Using this solution, the client is now able to test their application and deploy it on the production environment without downtime. The client's time to market is significantly reduced. The solution provides the flexibility to the client to orchestrate the infra as and when needed.

Third party applications or solutions used

Datadog:
DataDog is able to adopt Spire Health's dynamic environments and ensure new resources are automatically detected and monitored based on tagging criteria. It also has dynamic alerting that scales with infrastructure and monitors Spire's infrastructure across multiple accounts. Instead of monitoring fixed metrics, Datadog was also set up to identify metrics based on percentiles and provide alerting based on metrics over time.

AIOps which is a feature of Datadog that provides watchdog events which display recent trends in a metric and automatically aggregate performance statistics. Datadog also provides predictive analytics and machine learning capabilities which predicts metric growth in future and also identifies anomalies and outliers which cannot be manually detected.

Okta
We use Okta to provide Single Sign-On (SSO) access to AWS account. User can sign into Okta and he can launch any of web apps without having to reenter credentials. Okta establishes a secure connection with a user's browser and then authenticates the user to Okta-managed apps using SSO integration methods like Federated (supporting SAML or another proprietary federated authentication protocol) and also we use Okta to acquire temporary AWS credentials for AWS cli.

Terraform
Terraform is a software that enables us to define our whole infrastructure using code, hence it's called Infrastructure-as-Code (IaC). We can build new infrastructure, make changes and improvements, version our code to be shared and reviewed amongst team members, and even reproduce our code to be used in the future. We at Ibexlabs used terraform with CI/CD (CircleCI) to deploy AWS resources in across different environments with reusable modules.

DashSdk
We enabled Dash SDK to get a full inventory of compliance controls across HIPAA, SOC 2, NIST 800-53 and other cybersecurity standards. We can see how individual compliance standards are addressed by Dash administrative policies, passing security checks, and cloud security controls in AWS account.

CircleCI
For Continuous Integration and Continuous deployment (CI/CD) we use a SAAS based application CircleCI. We choose CircleCI because jobs run fast and builds can be optimized for speed. CircleCI can be configured to run very complex pipelines efficiently with sophisticated caching, docker layer caching, resource classes for running on faster machines, and performance pricing.

COPYRIGHT © 2020 IBEXLABS / **Spire Health** ▪ Case Study
www.ibexlabs.com

116 Village Blvd, Suite 200, Princeton NJ 08540
#303, New Mark House, Hitech City Rd, Patrika Nagar, HITEC City, Hyderabad, Telangana 500081, India

AWS Services used as part of the solution

Core Platform

Amazon Virtual Private Cloud (VPC)

To launch instances on a private, isolated network with multiple subnets, route tables, Internet and Nat gateways including NACLs and gain the benefits from AWS' scalable infrastructure and automatic failover from the provisioned virtual private gateway. Provides network packet logging with VPC flow logs.

Elastic Container Service (ECS)

ECS handles orchestration of containers by allowing us to run and maintain a specified number of tasks in the service of an Amazon ECS cluster. We are using ECS with Fargate that runs containers without having to manage servers or clusters of Amazon EC2 instances. With this, we no longer have to provision, configure, or scale clusters of virtual machines to run containers. This removes the need to choose server types, decide when to scale your clusters, or optimize cluster packing.It automatically handles the details of capacity provisioning, load balancing, scaling, and application health monitoring.

Elastic Container Register (ECR)

We are using ECR to maintain Docker images Secure, Highly available and Full managed. ECR eliminates the need to operate and scale the infrastructure required to power your container registry. There is no software to install Just push your container images to Amazon ECR and pull the images when you need to deploy. By using IAM roles and policies we are able to maintain Docker images in a secure way.

RDS

By using RDS we have created a highly available, scalable and secure database for applications running on ECS. Enabled the automated backups and manual backups in case of any DB terminations. With Multi-AZ we are able to maintain high availability and failover support for DB instances

AWS Identity and Access Management (IAM)

To maintain AWS resources in each environment secure and complaint we use IAM. By this we are able to create users, roles and policies for different aws resources With least privileges access.

AWS CloudTrail

For Continuous Integration and Continuous deployment (CI/CD) we use a SAAS based application CircleCI. We choose CircleCI because jobs run fast and builds can be optimized for speed. CircleCI can be configured to run very complex pipelines efficiently with sophisticated caching, docker layer caching, resource classes for running on faster machines, and performance pricing.

AWS Systems Manager

AWS Systems Manager facilitates resource and application management, reduces the time to resolve and detect functional issues, and builds it quite simple to perform and handle our infrastructure firmly at scale.

In Systems Manager we are using a couple of services like Session Manager, Parameter stores, Maintenance window, Patch Manager and Inventory

- **Session Manager**

  It is a fully managed AWS Systems Manager capability that lets you manage your Amazon EC2 instances through an interactive one-click browser-based shell or through the AWS CLI. By using Session Manager we are able to start a session with an instance in an account and also we are encrypting the session data using KMS keys.

- **SSM Parameter store**

  For secrets management to store data like passwords, database strings and license codes we are using Parameter stores. By this AWS services can retrieve secrets and configuration data from a central store.

- **SSM Maintenance Window**

  For regular OS patching and some software updates we use Systems Manager Maintenance Windows. Each Maintenance Window has a schedule, a duration, a set of registered targets, and a set of registered tasks.

- **Patch Manager**

  Patch Manager automates the process of patching Windows and Linux managed instances. Use this feature of AWS Systems Manager to scan your instances for missing patches or scan and install missing patches.

- **SSM Inventory**

  To maintain Inventory of EC2 instances we use SSM Inventory It will collect metadata from managed instances in our environments. By this, we are able to decide which instances are running the software and configurations required by our software policy, and which instances need to be updated.

COPYRIGHT © 2020 IBEXLABS / **Spire Health** • Case Study
www.ibexlabs.com

116 Village Blvd, Suite 200, Princeton NJ 08540
#303, New Mark House, Hitech City Rd, Patrika Nagar, HITEC City, Hyderabad, Telangana 500081, India

Securityhub

AWS Security Hub gives us a complete view of security status in an AWS account. It aggregates, organizes, and prioritizes your security alerts, or findings, from multiple AWS services, such as Amazon GuardDuty, Amazon Inspector, and Amazon Macie, as well as from AWS Partner solutions. Based on AWS's best practices and industry standards that our organization follows the AWS Security hub continuously monitors our environment using automated compliance checks.

AWS Config

By using AWS Config we are able to assess, audit, and evaluate the configurations of AWS resources. Config continuously monitors and records AWS resource configurations and allows us to automate the evaluation of recorded configurations against desired configurations.

Amazon GuardDuty

Amazon GuardDuty is a managed cloud security monitoring service that continuously detects threats on analyzing and processing the following data sources like VPC Flow Logs, AWS CloudTrail event logs, and DNS logs. It uses threat intelligence feeds, such as lists of malicious IP addresses and domains, and machine learning to identify unexpected and potentially unauthorized and malicious activity within our AWS environment. This can include issues like escalations of privileges, uses of exposed credentials, or communication with malicious IP addresses, URLs, or domains. This is the most cost-effective option for threat detection in the AWS Cloud

Amazon S3

For a highly scalable, fast, and durable solution for object-level storage of any data type we use S3 like Log archiving and assets storage etc...

Results

The combination of these best practice methods and AWS services allow Spire PHI privacy and security to move in tandem. Ibexlabs' innovative solution helps Spire meet increasing HIPAA compliance demands proactively and cost-effectively based on the latest AWS technologies. With the continuing weekly support and performance optimization from AWS Trusted Advisor, Ibexlabs is also able to address Spire evolving, complex cost optimization, reliability, and scalability needs. Furthermore, our ongoing support team maintains Spire software to streamline their software processes in the management of policies, billing & rating, and claims through high availability and fault tolerant performance. This process yielded a solution from Ibexlabs that is in full alignment with Spire business objectives.

> "
> We're now operating as a HIPAA compliant business, and Ibexlabs is providing ongoing support to ensure that we remain compliant. We've successfully completed several audits and assessments. "
>
> Ben Yule
> **CTO, Spire Health**

About Ibexlabs

Ibexlabs LLC is a DevOps & Managed Services provider and an AWS consulting partner. Our AWS certified AWS experts evaluate your infrastructure requirements and make recommendations based on your individual business or personal needs.

Ibexlabs believes in open communication, quality service, and custom solutions to the technical challenges of our clients. On Clutch.co, all our clients have the opportunity to detail our business relationship and report on Ibexlabs's successes and shortcomings. As of May 2020, Ibexlabs is proud to boast an overall rating of 5/5.

Visit us on Clutch.co here to see all our client reviews.

✉ engage@ibexlabs.com
📍 116 Village Blvd, Suite 200, Princeton NJ 08540
📍 #303, New Mark House, Hitech City Rd, Patrika Nagar, HITEC City, Hyderabad, Telangana 500081, India

www.ibexlabs.com

Ibexlabs