CASE STUDY

HealthBridge Financial

Ibexlabs

aws certified
AWS PARTNER NETWORK

aws partner network
Advanced
Consulting Partner
- DevOps
- Healthcare
- Security
- Managed Service
- Well Architected Program

Key Facts

HealthBridge Financial is an Insurtech company that unites all parties with a stake in healthcare payments. This includes employees, employers, providers and payers in a single application that is both easy to use and suitable for a variety of situations.

HealthBridge covers the immediate costs of members' medical claims, and then consolidates relevant payment information in one place, making this otherwise arduous process as stress-free as possible.

This benefits every member of the healthcare vertical by making sure payments are immediately made to the relevant parties.

HealthBridge

Project Dates

January 2020 → June 2020

Challenge

Insurtechs are technology-led businesses that enter the insurance sector by taking advantage of new technologies to deliver coverage to a more digitally savvy customer base. HealthBridge Financial's patient-centric business model is designed to help employees manage out-of-pocket medical expenses like deductibles and coinsurance. To achieve this goal, the company's SaaS platform connects all parties with a stake in payment from the health insurer and provider to the patient by facilitating the. entire healthcare experience.

HealthBridge Financial engaged Ibexlabs to help design, architect, and manage its entire IT infrastructure and set about helping the company achieve regulatory compliance, stabilizing their IT infrastructure, and optimizing security to support and protect the company's SaaS platform. Having achieved AWS Security and Healthcare Competency certifications, Ibexlabs had a proven track record of helping healthcare organizations like HealthBridge secure their sensitive patient data.

Ibexlabs did this while providing day-to-day IT support and management of all of their cloud architecture, as well as providing expert leadership on performance enhancements.

AWS was ideal for running sensitive workloads regulated under the HIPAA/HITRUST frameworks. Through Amazon Web Services, Ibexlabs was able to operate HealthBridge Financial's infrastructure according to HIPAA compliance requirements and support their HITRUST certification process.

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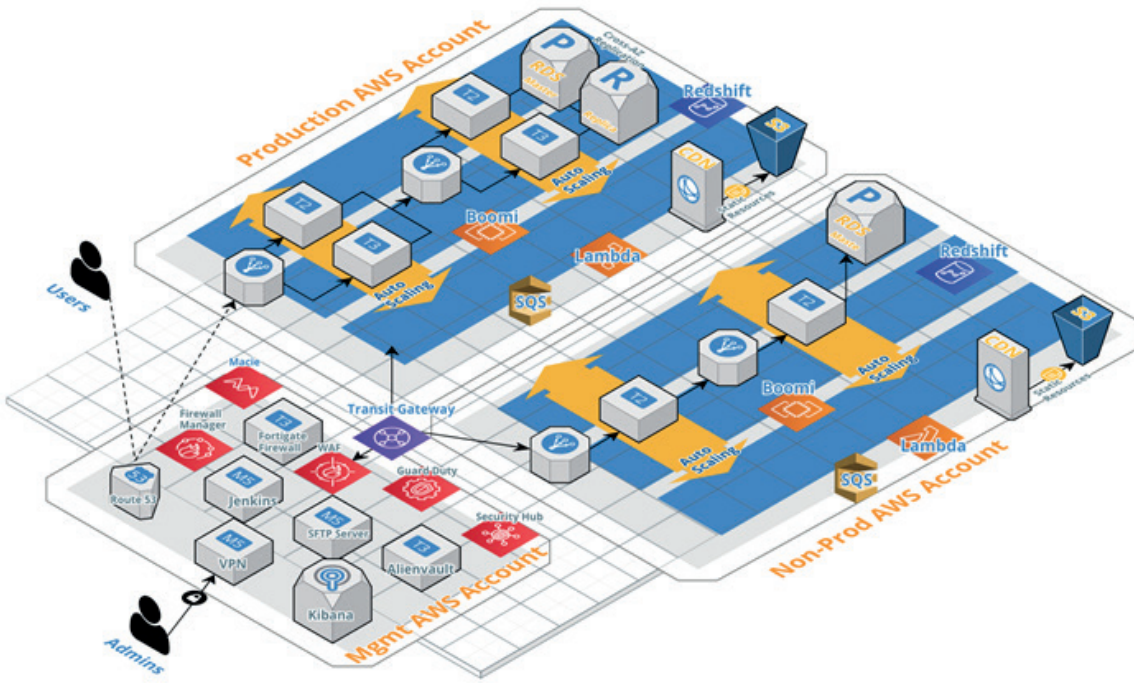
The Ibexlabs Solution

AWS Services Used

- AWS CloudFormation
- AWS Systems Manager
  - SSM Session Manager
  - SSM Patch Manager
  - SSM Maintenance Window
  - SSM Parameter store
  - SSM Inventory
  - SSM State Manager
- AWS Config and Config Rules
- Amazon Virtual Private Cloud (VPC)
- ElasticBeanstalk
- Amazon Cloudwatch
- Amazon CloudFront
- AWS CloudTrail
- AWS (IAM)
- Amazon S3
- SecurityHub
- Amazon SNS
- RDS

Third-Party Services

- NewRelic
- AlienVault
- Okta



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Third party applications or solutions used:

Newrelic:

NewRelic provided monitoring solutions for the infrastructure and applications running in the AWS environment. NewRelic is able to adapt to dynamic environments and can provide both infrastructure and application performance monitoring. This service also includes alerts when workload outcomes/anomalies require specific actions to resolve.

Okta

Ibexlabs used Okta to provide Single Sign-On (SSO) access to the AWS account. Okta establishes a secure connection with a user's browser and then authenticates the user through SSO integration methods like Federated (supporting SAML) and fine-grained IAM policies attached to the roles for various IT departments.

AlienVault

For threat and vulnerability detection, Ibexlabs leveraged AlienVault. AlienVault is a third-party AWS technology partner. AlienVault USM Sensor provides a unified dashboard for all security events within the platform including AWS CloudTrail, AWS VPC FlowLogs, AWS GuardDuty, and Macie that have been enabled across all regions and accounts. Also, the USM agent—which is deployed across all the HBF infrastructure (VMs)—reports on any new vulnerabilities within the OS.

AWS Services used as part of the solution:

Amazon Virtual Private Cloud (VPC)

To launch instances on a private, isolated network, Ibexlabs leveraged AWS VPC. This supported multiple subnets, route tables, Internet and NAT gateways, including NACLs. In addition this incorporates the benefits of AWS' scalable infrastructure and automatic failover from the provisioned virtual private gateway. This service also provides network packet logging with VPC flow logs.

AWS CloudTrail

This service enables in-depth auditing of the AWS account. With CloudTrail, it's possible to log, monitor, and retain account activity related to actions across the AWS infrastructure. This service provides event history of AWS account activity, such as actions taken through the AWS Management Console, command-line tools, and other AWS services. Ibexlabs also enabled alerts by using CloudTrail logs in case of any unusual activities in an AWS account like IAM users without MFA login, etc.

AWS Systems Manager

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

In Systems Manager Ibexlabs used a number of services like Session Manager, Parameter Stores, Maintenance Window, Patch Manager, and Inventory.

AWS Identity and Access Management

To maintain AWS resources in each environment secure and compliant Ibexlabs used AWS IAM. With this service, Ibexlabs could create users, roles, and policies for different AWS resources, with least privileges access.

AWS SecurityHub

Using AWS Security Hub, it's easy to view the security status of Healthbridge's AWS account. This service aggregates, organizes, and prioritizes our 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, AWS Security Hub continuously monitors our environment using automated compliance checks.

AWS Elastic Beanstalk

The Healthbridge stack is made up primarily of a backend API and applications written in Java, as well as a frontend based on React. To set up this hosting platform for the backend in a quick, cost-effective, and compliant way, Ibexlabs chose Elastic Beanstalk. This provided a Java-based run time and also took care of best practices such as auto-scaling, reliability, and availability. The backend infrastructure is made up of API and workers, and Elastic Beanstalk was the natural choice to provide a quick and cost-effective way for to build this hosting platform.

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AWS Services used as part of the solution:

Simple Notification Service (SNS)
Amazon SNS is a fully managed service that is used to send notifications to a subscription. The content of the notification is defined by the SNS topic in AWS. In conjunction with AWS Config, this was used to send a notification to a central email when there is a change in any resource of the production environment.

AWS Cloud Relational Database (RDS)
By using RDS Ibexlabs created a highly available, scalable, and secure database for applications running on Beanstalk. Ibexlabs enabled the automated backups and manual backups in case of any DB terminations. With Multiple Availability Zones, it is possible to maintain high availability and failover support for DB instances.

AWS CloudFront
To speed up the distribution of static and dynamic web content (such as .html, .css, .js, and image files) to users, Ibexlabs used CloudFront. CloudFront delivers content through a worldwide network of data centers called edge locations, providing low-latency access to the end-user.

Amazon S3
For a highly scalable, fast, and durable solution for object-level storage of any data type, Ibexlabs used S3 for activities like log archiving and assets storage, etc.

AWS Config

AWS Config is a fully managed service that provides an AWS resource inventory, configuration history, and configuration change notifications to enable security and governance.

By using AWS Config, engineers can continuously monitor AWS resource types and record point-in-time views of their various attributes as configuration items. Through this service, it's possible to see every resource configuration of every resource type in all regions and in all AWS accounts. Resource changes and evaluation results can also be delivered to S3 buckets which are encrypted with (SSE-S3) encryption type and monitored via SNS notifications. AWS Config also correlates resource configuration changes with API actions recorded by AWS CloudTrail. Using the Aggregator view, it is simple to see all remaining accounts and region compliance status at one place. This provides a clear view of overall compliant and non-compliant resources in all accounts and regions.

Config Conformance Packs:
By bundling several config rules together, it is possible to monitor AWS assets from a compliance perspective. When violations occur, automated alerts will automatically be sent to an operations team for remediation. Also, conformance packs allow for custom rules using AWS Lambda, which provides greater flexibility. Ibexlabs used AWS config conformance packs of operations for the best practices of CIS, NISTCSF and PCIDSS.

Security Compliance:
With Config, Ibexlabs enforced strict compliance against specific security controls. Being notified of non-compliant resource configurations from a security stance is critical, especially in highly sensitive environments, where these controls are imperative to protect both internal corporate and external customer data. Through the use of config rules, services are continually monitored, so resources remain compliant throughout their life cycles.

Discovery of Resources:
AWS Config will discover all supported resource types, allowing a clear view of them from within the AWS Config dashboard. A configuration item is recorded for each, and these resources can also be found in the configuration history file on the S3 service.

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AWS Config

Resource Change Management: By using configuration items in AWS Config, it is possible to use the dashboard to list all related resources of a particular resource. This allows engineers to plan changes more effectively, by ensuring all resources continue to function as expected after changes have been made. This helps to prevent outages and configurational mistakes by having an overall better visual awareness of the environment.
Audit Compliance: By using AWS Config it is possible to maintain environment compliance with internal security standards. Also included are governance controls specific to particular regulations, like HIPAA and PCI DSS. Auditors can see all of the configuration history files, allowing them to go back to any point in time to check the configuration of any of the supported resources.
Troubleshooting: With AWS Config, it is possible to check the changes in the configuration of any particular resource. Integration with CloudTrail allows administrators to see who or what triggered the change.
Deployments
For Infrastructure automation Ibexalbs used CloudFormation, To enable config and config rules Ibexlabs created CloudFormation templates and deployed those resources in respective AWS accounts. Also, CloudFormation creates a config aggregation view of multiple accounts.
Workload
Config automatically delivers a configuration history file for each resource type to a specified S3 bucket. Ibexlabs created an S3 bucket on the management account and all child accounts. In addition, AWS config snapshots are stored in that S3 bucket, encrypted with an Amazon S3 master-key (SSE-S3).
Through AWS managed config rules Ibexlabs implemented the DB-instance-backup-enabled rule. This rule displays a non-compliant status if the database backup is not available for 35 days. Whenever the rule changes from a compliant to a non-compliant rule in AWS Config, a notification is automatically generated from SNS showing the config rule to be non-compliant.
Config Custom Rules
Config allowed Ibexlabs to create custom rules, and associate each custom rule with an AWS Lambda function. Each of these functions contained the instructions that evaluate whether AWS resources comply with a given rule. A resource is compliant if it complies with all of the AWS Config rules that evaluate it. A resource is non-compliant if it does not comply with one or more of these rules.

The front end is a ReactJS application served using Amazon S3 with CloudFront being leveraged for CDN functionality.

With the hosting infrastructure processing PII data, encryption was a strong requirement for data at rest and in transit. For data at rest, encrypted EBS volumes have been leveraged. Also, all application S3 buckets and RDS instances have encryption turned on by default.

For data in transit, AWS Certificate Manager (ACM) was leveraged for SSL certificates wherever required. Also, for traffic between Application Load Balancers and application instances self-signed SSL certificates were utilized to make sure traffic is always encrypted in transit.

Central Logging and Monitoring

For central logging of application and OS level logs, Ibexlabs leveraged AWS Elastic Search Service. All the servers in HBF infrastructure are configured with a Filebeat agent which forwards the logs to ElasticSearch. The logs are then made available via Kibana which is available only on the Virtual Private Network (VPN).

Ibexlabs also leveraged NewRelic, a third-party service who is part of the AWS Partner network to monitor infrastructure. NewRelic has been configured with different dashboards for each environment. The dashboards display infrastructure metrics such as CPU, Disk Usage, and also application metrics such as request count, queue sizes, and any dead letter topics in SQS, etc.

Results

The combination of these best-practice methods and AWS services allow Healthbridge Financial's PHI privacy and security to move in tandem. Ibexlabs' innovative solution helps HBF 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 HBF's evolving, complex cost optimization, reliability, and scalability needs. Furthermore, our ongoing support team maintains Healthbridge's 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 HBF's business objectives.

> "I was looking for a strategic partner to help me create and implement a very robust, HIPAA-compliant, and secure AWS infrastructure. I've been very impressed with the entire Ibexlabs team and highly recommend others to work with them."
>
> Tim Heger,
> **CTO, HealthBridge Financial**

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.

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