

nClouds | AWS Case Studies

XCLAIM

nClouds helps fintech startup XCLAIM modernize its AWS infrastructure for faster time-to-market and improved operational efficiency.

FINTECH
FINANCIAL TECHNOLOGY**Industry**

Financial Exchanges, Financial Services, Fintech, Legal Tech

Location

Los Angeles, CA

Challenge

Modernize its AWS infrastructure for faster time-to-market and improved operational efficiency.

Featured Services

AWS Well-Architected Framework Review, DevOps Services, Security

About XCLAIM

Founded in 2018, XCLAIM is revolutionizing the bankruptcy claims market by aggregating all US bankruptcy claims into a single centralized marketplace. Bankruptcy claims are unpaid receivables to vendors, suppliers, landlords, employees, and other creditors. Rather than wait years for the bankruptcy court processes to issue payment distributions, creditors can sell their claim to interested buyers. Last year, more than \$400 billion of bankruptcy claims were traded.

XCLAIM's platform is the first of its kind to enable digital trading of bankruptcy claims at scale. The company's mission is to maximize value and empower all stakeholders in the claims trading ecosystem by digitally enhancing the efficiency and transparency of today's bankruptcy trading markets. For more information about XCLAIM, go to: x-claim.com

Benefits Summary



High availability and scalability



Enhanced fault tolerance



Automation for faster time-to-market and operational efficiency

CHALLENGE

Modernize its AWS infrastructure for faster time-to-market and improved operational efficiency.

To support the fast growth of this startup company, XCLAIM needed a modern infrastructure with increased automation to deploy new features faster and improve operational efficiency.

Why AWS and nClouds

XCLAIM'S Chief Technology Officer (CTO) valued his previous experience with nClouds when he worked at another nClouds customer. He asked nClouds to perform an AWS [Well-Architected Framework Review](#), which identified remediations required to achieve best practices. nClouds then was engaged to make those remediations.

As an early-stage startup, XCLAIM initially used nClouds for small projects, such as improving its Amazon ECS-based compute platform. XCLAIM also contracted with nClouds to provide ongoing support of its DevOps roadmap. As the company grew, it expanded nClouds' engagement.

XCLAIM leveraged several Amazon Web Services:

- **Amazon CloudWatch (CloudWatch)** - Monitors applications, responds to system-wide performance changes, optimizes resource utilization, and provides a unified view of operational health.
- **Amazon DynamoDB** - A key-value and document database that delivers single-digit millisecond performance at any scale. It's a fully managed, multi-region, multi-active, durable database with built-in security, backup and restore, and in-memory caching for internet-scale applications.
- **Amazon ElastiCache for Redis** - An in-memory data structure service to enhance the ease-of-use and power of Redis, and improve availability, reliability, scalability, security, and performance.
- **Amazon Elastic Compute Cloud (Amazon EC2)** - A web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers. It provides complete control of computing resources, and runs on Amazon's proven computing environment.
- **Amazon Elastic Container Registry (Amazon ECR)** - A fully-managed Docker container registry integrated with Amazon ECS that makes it easy for XCLAIM to store, manage, and deploy Docker container images.
- **Amazon Elastic Container Service (Amazon ECS)** - A highly scalable, high-performance container orchestration service that supports Docker containers and enables XCLAIM to run and scale containerized applications on AWS easily.
- **Amazon Elasticsearch Service** - A fully managed service that makes it easy for XCLAIM to deploy, secure, and operate Elasticsearch at scale with zero downtime.
- **Amazon RDS for PostgreSQL** - Makes it easy for XCLAIM to set up, operate, and scale PostgreSQL deployments in the cloud.
- **Amazon Redshift** - Enables XCLAIM to analyze all its business data using existing business intelligence tools.
- **Amazon Route 53** - A highly available and scalable cloud Domain Name System (DNS) web service that provides a reliable and cost-effective way to route XCLAIM's end users to internet applications.
- **Amazon Simple Storage Service (Amazon S3)** - A flexible way to store and retrieve data, providing XCLAIM with cost optimization, access control, and compliance.
- **Amazon Virtual Private Cloud (Amazon VPC)** - Enables XCLAIM to provision a logically isolated section on AWS where they can launch AWS resources in a virtual network that they define.
- **AWS Application Load Balancer (AWS ALB)** - To support content-based routing and applications that run in containers.



“nClouds is very responsive to our needs and is a valuable extension of our team. I appreciate their clear communication of tasks and timing for their ongoing DevOps support of XCLAIM's infrastructure on AWS.”

Stuart Posin,
Co-Founder & CTO,
XCLAIM

- **AWS Auto Scaling** - Monitors XCLAIM's applications and automatically adjusts capacity to maintain steady, predictable performance at the lowest possible cost.
- **AWS Availability Zone (AWS AZ)** - One or more discrete data centers with redundant power, networking, and connectivity in an AWS Region, enabling XCLAIM to operate production applications and databases that are more highly available, fault-tolerant, and scalable than would be possible from a single data center.
- **AWS Chatbot** - An interactive agent that makes it easy to monitor and interact with AWS resources in Slack channels and Amazon Chime chat rooms.
- **AWS CloudFormation (CloudFormation)** - Allows XCLAIM to treat its infrastructure as code, automate operations, and bring up new environments.
- **AWS CloudTrail (CloudTrail)** - For governance, compliance, operational auditing, and risk auditing of the AWS account.
- **AWS CodeBuild** - A fully managed continuous integration service that compiles source code, runs tests, and produces software packages that are ready to deploy.
- **AWS CodePipeline** - A fully managed continuous delivery service that helps XCLAIM automate the build, test, and deploy phases of release pipelines to rapidly and reliably deliver features and infrastructure updates.
- **AWS Database Migration Service (AWS DMS)** - Facilitates migration of data from one datastore to another quickly and securely.
- **AWS Fargate** - Enables XCLAIM to run containers without having to manage servers or clusters.
- **AWS Lambda (Lambda)** - Enables XCLAIM to run code without provisioning or managing servers. Pay only for the compute time consumed – there is no charge when code is not running.
- **AWS Secrets Manager** - Enables XCLAIM to protect secrets needed to access its applications, services, and IT resources.
- **AWS Systems Manager Parameter Store** - Provides XCLAIM with secure, hierarchical storage for configuration data management and secrets management.
- **AWS Transfer for FTP** - Makes it easy to migrate and securely run File Transfer Protocol over FTP workloads in AWS.
- **AWS Web Application Firewall (AWS WAF)** - Helps protect web applications or APIs against common web exploits that may affect availability, compromise security, or consume excessive resources.

XCLAIM's solution stack also included additional, essential third-party tools:

- **Datadog** - A monitoring and analytics tool to determine performance metrics and event monitoring for infrastructure and cloud services. The software can monitor services such as servers, databases, and tools.
- **Docker** - An open-source container platform to build, ship, and run distributed applications.
- **GitHub** - A development platform to host and review code, manage projects, and build software.
- **Looker** - A business intelligence software and big data analytics platform that helps XCLAIM explore, analyze and share real-time business analytics easily.
- **nOps** - A SaaS cloud management and intelligence platform that continuously optimizes cost, security, performance, reliability, and operational excellence, aligned with AWS Well-Architected Framework best practices.
- **OpenVPN Access Server** - A full-featured SSL VPN software solution to provide fine-grained access control of the infrastructure.
- **Slack App Integrations (Slack)** - A cloud-based instant messaging tool that enables workplace collaboration, and integrates with other products that XCLAIM uses.

nClouds' Solution Architecture for XCLAIM

Applying AWS Well-Architected Framework best practices guidance, nClouds improved the existing Amazon ECS-based compute platform. AWS Auto Scaling now adjusts capacity to maintain steady, predictable performance, and AWS services are deployed across two AZs for high availability, fault tolerance, and scalability.

nClouds performed infrastructure buildout using CloudFormation templates to deploy the initial resources: subnets, route tables, security groups, internet gateways, NAT gateways, and peering connections. The templates connected a new environment VPC to the management VPC, with an OpenVPN server to provide a secure and private way to access resources.

After creating the initial resources, CloudFormation templates deployed the necessary resources to run the applications, with one task definition and Amazon ECS service for each application. All services run in a single Amazon ECS cluster. Four proprietary XCLAIM applications were deployed.

Task definitions specify how containers should be provisioned including memory and CPU requirements, Docker repository and images, shared data volumes, and how the containers connect to each other. Every task definition is composed of the image built with the client-provided application. Images are stored and updated in Amazon ECR. A Datadog Docker image and a Fluent Bit Docker image provide the ability to ship the application logs. The application is then enabled to communicate with the database launched in Amazon RDS.

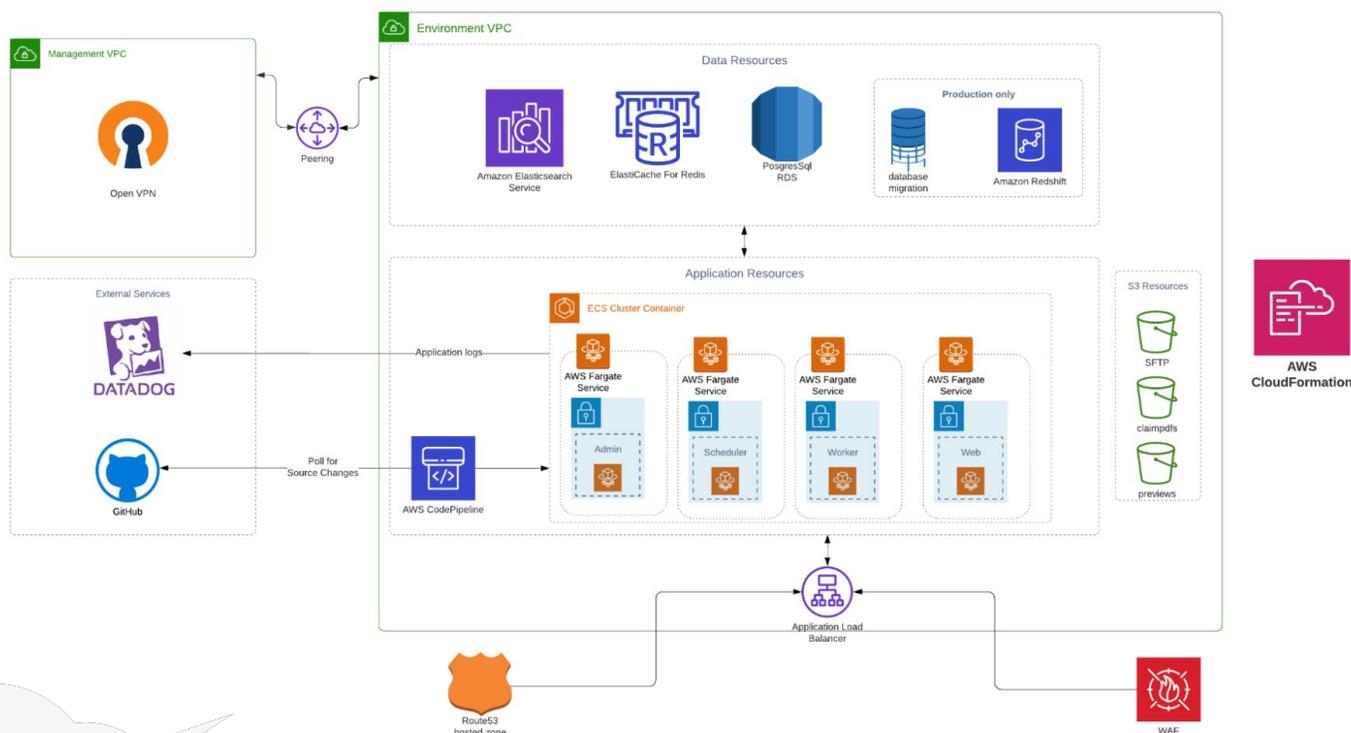
nClouds developed a fully automated CI/CD pipeline in AWS CodePipeline with three stages. The first stage pulls the application code from a GitHub repository. The second stage builds the application image and pushes it to Amazon ECR. The third stage grabs the latest application image and deploys it to the Amazon ECS cluster. All the services pull parameters from AWS Secrets Manager and AWS Systems Manager Parameter Store to keep sensitive data safe. AWS WAF secures the application layer by protecting web-facing applications from DDoS attacks.

For production only, a CloudFormation template deploys the Amazon Redshift cluster. XCLAIM, with the aid of business intelligence software Looker, explores, analyzes and shares real-time business analytics. To populate the Amazon Redshift cluster, conduct schema transformation, and save data integrity, a migration task deploys to migrate data from the Amazon RDS instance to the Amazon Redshift cluster.

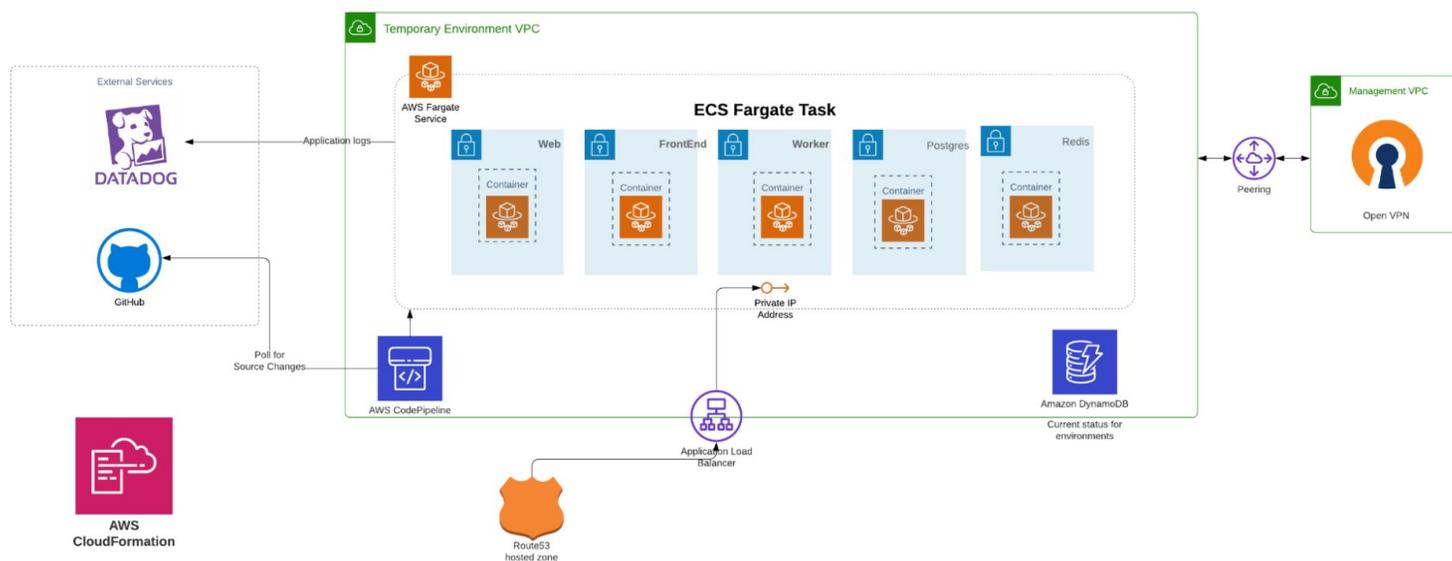
nClouds also created a temporary environment for customer demos and testing. A single Amazon ECS service is used within the temporary environment, containing a single task running the four applications and the database within it.

High-level architecture diagrams:

Main environment



Temporary Environment



The Benefits

XCLAIM's roadmap of innovations, digital efficiencies, and partnering with nClouds' talented engineers is a textbook win-win scenario for both companies. The project has yielded numerous benefits to XCLAIM:



High availability and scalability

A successful production environment requires database systems that are always available, have minimal if any planned outages, and scale quickly and easily as business requirements change. AWS Auto Scaling automatically adjusts capacity to maintain steady, predictable performance. Amazon ECS provides highly scalable, high-performance container orchestration. Amazon ElastiCache for Redis improves availability, reliability, scalability, security, and performance. Amazon Route 53 provides a highly available and scalable way to route XCLAIM's end users to internet applications. Amazon EC2 provides secure, resizable compute capacity. AWS WAF protects XCLAIM against common web exploits that may affect availability, compromise security, or consume excessive resources.



Enhanced fault tolerance

Fault tolerance is a feature that enables a system to continue with its operations even when there is a failure in one part of the system. AWS services deploy across two AZs for high availability, fault tolerance, and scalability. Amazon S3 stores objects redundantly on multiple devices across multiple facilities in an AWS Region. So even in the rare case of a failure in an AWS data center, XCLAIM still has access to its data. AWS ALB is inherently fault-tolerant because it detects unhealthy instances within the pool of EC2 instances and automatically reroutes traffic to healthy instances. AWS Lambda has built-in availability and fault tolerance. Amazon DynamoDB's point-in-time recovery (PITR) provides continuous backups of DynamoDB table data. With a single click in the AWS Management Console or a single API, it can restore that table to any point in time up to the second during the preceding 35 days.



Automation for faster time-to-market and operational efficiency

Automated deployment improves productivity and reduces errors to eliminate rework, wait times, and the business impact of failures in production. AWS CodePipeline helps XCLAIM rapidly and reliably deliver features and infrastructure updates. AWS CodeBuild scales continuously and processes multiple builds concurrently, so builds are not left waiting in a queue. AWS Lambda automatically runs code without requiring XCLAIM to provision or manage servers and automatically scales applications by running code in response to triggers. CloudFormation automates operations. CloudWatch automates the monitoring of cloud resources and applications. CloudTrail automatically records and stores event logs. Auto Scaling automatically adjusts capacity. Temporary environments are automatically created or deleted using Slack integration.

About nClouds

nClouds is a certified, award-winning provider of AWS and DevOps consulting and implementation services. We partner with our customers, as extensions of their teams, to build and manage modern infrastructure solutions that deliver innovation faster. We leap beyond the status quo.

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