nClouds | AWS Case Studies

Augmedix

How nClouds helped Augmedix automate and containerize their cloud infrastructure to improve scalability, deliver new features faster, optimize costs, and enhance security.

About Augmedix

Founded in 2012, Augmedix is a service, powered by Google Glass, that allows doctors to focus on what matters most: patient care. Augmedix simplifies how physicians use electronic health records (EHRs) by providing a technology-enabled documentation service for health systems and doctors.

They are on a mission to re-humanize the doctor-patient relationship and address the greatest pain point in the US healthcare system – the burden of documentation. The Augmedix service saves doctors an average of 15 hours per week, enabling them to see more patients and spend more time with their existing patients. As a result, there is increased provider satisfaction, improved patient experience, higher quality patient notes, and timely note completion.

Augmedix is partnered with several national health systems, serving tens of thousands of patients per month. To learn more, go to www.augmedix.com

Benefits Summary

Improved scalability	Optimized time to market	Cost savings	Enhanced security

Industry

Health care, Hospital, Medical, Augmented Reality

Location

San Francisco, California

Challenge

Augmedix needed an automated, containerized cloud infrastructure to improve scalability, deliver new features faster, optimize costs, and enhance security.

Featured Services

AWS Well-Architected Review, containerization, infrastructure automation (Amazon CloudWatch, AWS Application Load Balancer), nClouds 24x7 on-call support

"We selected nClouds because of their innovative culture and technical expertise in AWS. We partnered with them to build a containerized cloud infrastructure so that Augmedix could focus on new feature development."

— Sabbir Hossain International Operations Manager, Head of Software Development, Augmedix

CHALLENGE

Augmedix needed an automated, containerized cloud infrastructure to improve scalability, deliver new features faster, optimize costs, and enhance security.

Augmedix required containerization to bring consistency across the environment, deliver the necessary scalability for their fast-growth startup, and enhance security. They wanted to optimize their time to market for new features by deploying a continuous integration and continuous delivery (CI/CD) pipeline. And, they needed to automate their web apps, services, data channel, and media streaming infrastructure to enhance performance efficiency.

Why AWS and nClouds

Augmedix turned to nClouds, a Premier Consulting Partner in the Amazon Web Services (AWS) Partner Network and certified AWS Well-Architected Partner, to perform an AWS Well-Architected Review. The Review is an assessment of their infrastructure using best-practices guidelines from the AWS Well-Architected Framework. The Review revealed opportunities to improve the company's infrastructure across the five pillars of the Framework: cost optimization, security, reliability, performance efficiency, and operational excellence.

After the Review, Augmedix asked nClouds to partner with them to remediate key issues.

Augmedix leveraged several Amazon Web Services:

- **Amazon CloudWatch -** Provides Augmedix with monitoring and log management.
- **Amazon EC2 -** A web service that provides Augmedix with secure, resizable compute capacity in the cloud.
- **Amazon EC2 Reserved Instances -** Provides Augmedix with a significant discount (up to 75%) compared to On-Demand pricing and provides a capacity reservation when used in a specific Availability Zone.
- **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 RDS for MySQL -** Manages time-consuming database administration tasks including backups, software patching, monitoring, scaling and replication.
- **Amazon Virtual Private Cloud (Amazon VPC) -** Enables Augmedix to provision a logically isolated section of the AWS Cloud where they can launch AWS resources in a virtual network that they define.
- **AWS Application Load Balancer -** To support content-based routing and applications that run in containers.
- **AWS Auto Scaling groups -** Monitors Augmedix's applications and automatically adjusts capacity to maintain steady, predictable performance at the lowest possible cost.
- **AWS Identity and Access Management (AWS IAM) -** To control users' access to AWS services.
- **AWS OpsWorks -** A configuration management service that provides managed instances of the Chef automation platform, enabling Augmedix to use code to automate the configurations of   their servers.
- **AWS Well-Architected Review -** Uses the AWS Well-Architected Framework to provide a consistent approach to evaluate and remediate systems, based on best practices for building and managing reliable, secure, efficient, cost-optimized, and operationally excellent systems for the cloud.

aws partner network

Premier
Consulting
Partner

AWS CloudFormation

Data & Analytics Competency

DevOps Competency

Immersion Day Partner

Marketplace Seller

aws partner network

Premier
Consulting
Partner

Migration Competency

MSP Partner

Public Sector Partner

SaaS Competency

Well-Architected Partner Program

Augmedix's solution stack also includes additional, essential third-party tools and services:

- **Amazon CloudWatch -** Provides Augmedix with monitoring and log management.
- **Chef -** Provides automated configuration management to enable consistent configurations at scale.
- **Datadog -** A monitoring service providing visibility into Augmedix's entire environment.
- **Docker -** An open-source container platform to build, ship, and run distributed applications.
- **Docker Compose -** A tool for defining and running multi-container Docker applications. Jenkins - An open source automation server written in Java, to support CI/CD.
- **Logz.io -** Provides Elasticsearch, Logstash, and Kibana on the cloud with alerts, unlimited scalability, and free ELK apps to index, search, and visualize Augmedix's data.
- **nClouds 24x7 On-Call Support Services** - Provide quick response to events affecting Augmedix's environment.

nClouds' Solution Architecture for Augmedix

A well-architected infrastructure enables faster updates and decreased time to market. nClouds performed an AWS Well-Architected Review with Augmedix, which revealed architecture remediations that could be implemented to drive best practices in CI/CD. Following the Review, Augmedix asked nClouds to perform the remediations.

Augmedix's new architecture has a containerized environment using Docker and Docker Compose (to bring up local environments) that employs best practices in cost optimization, performance efficiency, reliability, security, and operational excellence.

A cost-optimized system avoids or eliminates unneeded cost or suboptimal resources.
- An Amazon ECS cluster of three private subnets with EC2 instances running tasks (each in a separate Availability Zone)
- nClouds recommended that Augmedix utilize Amazon EC2 Reserved Instances to save on Amazon EC2 and Amazon RDS costs.
- Amazon EC2 supports right-sizing (using the lowest cost resource that still meets the technical specifications of a specific workload) by enabling stop-and-start to allow a change of instance size or instance type.
- CloudWatch analysis of resources (e.g., underutilized resources) helps identify candidates for right-sizing. CloudWatch also provides billing alerts that notify Augmedix when usage of their services exceeds financial thresholds that they defined.
- Applying tags to AWS resources (such as EC2 instances or Amazon S3 buckets) helps Augmedix track costs.

Performance efficiency best practices call for a data-driven approach, using monitoring to provide alerts on any performance deviations that require action.
- Clouds worked with Augmedix to improve the performance efficiency of their architecture by including CloudWatch to monitor and respond to systemwide performance changes.
- Because a workload's database approach impacts performance efficiency, nClouds implemented Amazon RDS for MySQL for master and read replicas to run MySQL in an automated environment.

A reliable system should have a well-planned foundation with scalability to handle changes in demand or requirements.
- AWS Auto Scaling groups to maintain steady, predictable performance at the lowest possible cost.
- nClouds recommended and implemented AWS Application Load Balancer to enable multiple containers to serve the same service on a single Amazon EC2 instance, increasing scalability.
- AWS OpsWorks dynamically configures newly provisioned instances by automatically registering new instances in Auto Scaling groups with the Chef server, to enable easy deployments.

A secure system has an architecture that protects data and systems, controls access, and responds automatically to security events. The new architecture includes:

- Secure key management for data pipeline.
- AWS IAM to control users' access to AWS services.
- Amazon VPC advanced security features, such as security groups and network access control lists, to enable inbound and outbound filtering at the instance level and subnet level.

Operational excellence best practices rely on the ability to run systems and gain insight into their operations to deliver business value and to continuously improve supporting processes and procedures.

- nClouds worked with Augmedix to implement a CI/CD pipeline (to deploy in a repeatable, consistent, and low-cost fashion as Augmedix iterates). Jenkins automates their CI/CD pipeline.
- Logging provides insight on what's happening in a workload and the internal state of the system. nClouds implemented Logz.io, a common log aggregation platform (to ingest all logs from web apps, data channels, media streaming servers, other services in the production environment, and clone and test/staging servers) and Amazon CloudWatch (centralized log management).
- Datadog and Amazon CloudWatch provide health and performance monitoring so that Augmedix can scale rapidly and maintain operational excellence.
- nClouds' 24x7 On-Call Support provides Augmedix with quick response to events affecting their environment to maximize uptime and business continuity. Based on real-time environment health insights, nClouds prevents many issues from ever occurring, and, when needed, steps in to remediate incidents.
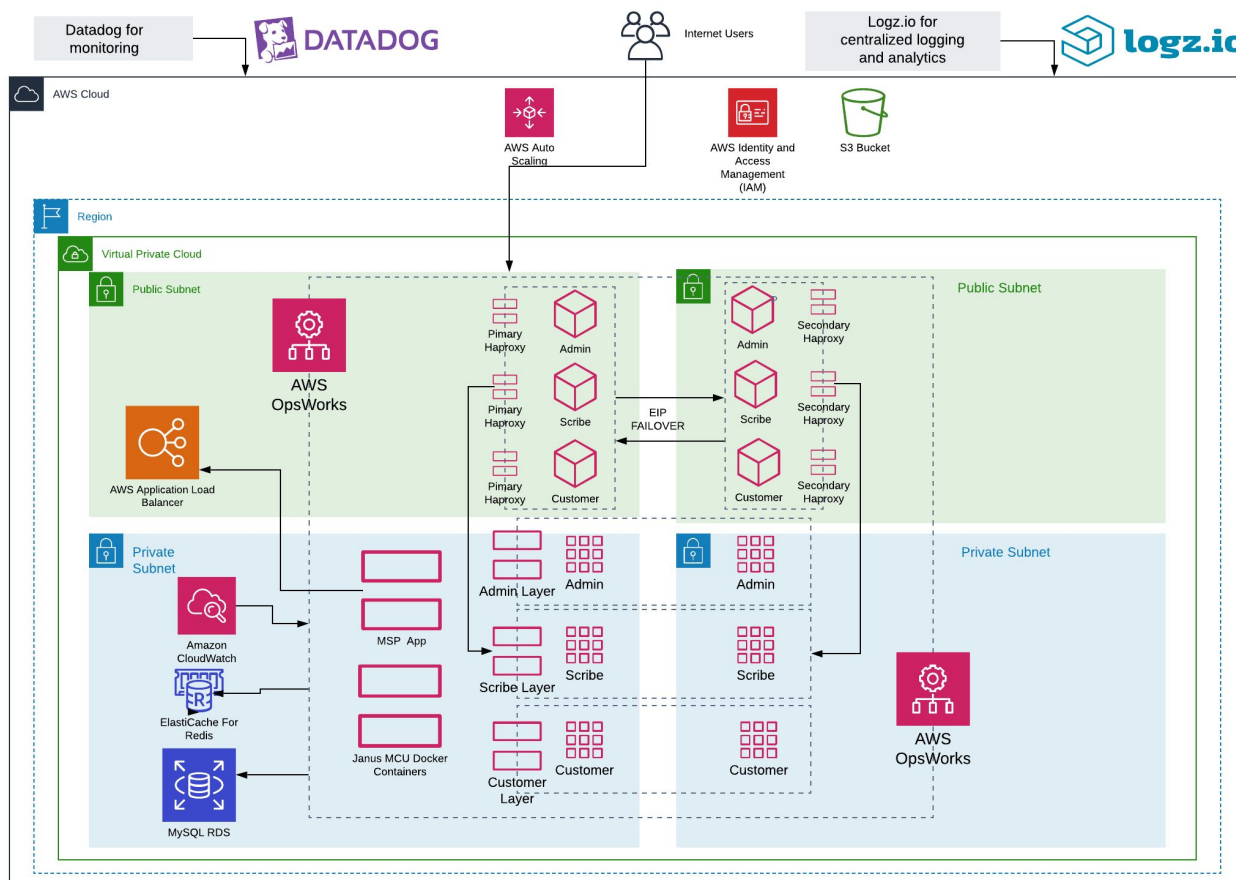
The Benefits

Teaming with nClouds, Augmedix implemented a modernized, secure, efficient, and scalable environment on AWS cloud. The project has yielded numerous benefits:

Improved scalability

Augmedix's architecture now has best-practices reliability, with improved scalability to handle changes in demand or requirements to support their fast-growing business. Scalability is supported by AWS Application Load Balancer, AWS Auto Scaling, and AWS OpsWorks, in concert with the Chef server.

Optimized time to market

With a localized container environment and automation, Augmedix has more flexible deployment and can deliver new features faster. Their new CI/CD pipeline enables rapid testing, spin up, and spin down. Augmedix can now quickly go from ideating new features to creating, testing, and merging into their code to ultimately deliver new features.

Cost savings

Using CloudWatch, Augmedix can monitor usage and spending, identify underutilized and unused resources, centrally deploy the infrastructure, and implement standardization to help control costs. nClouds recommended that Augmedix use Amazon EC2 Reserved Instances planning to save costs.

Enhanced security

Because Augmedix works with electronic health records (EHRs), it's imperative that they preserve privacy and confidentiality by ensuring that only authorized individuals have access to patient health information. Augmedix's new infrastructure enhanced security by implementing AWS IAM (to control users' access) and Amazon VPC (to provide security groups and network access control lists).

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.

www.nclouds.com | +1-866-673-9330 | sales@nclouds.com | info@nclouds.com | subscribe for updates