

CLOUD-NATIVE MICROSERVICES ARCHITECTURE FOR SECURE AND SCALABLE APPLICATION

CAPABILITIES SHOWN



Advisory Services



Cloud Migration



Digital Transformation



Cloud Engineering



Observability & Monitoring

ABOUT THE COMPANY

We are an ISO 9001:2008, 9001:27001, 20000-1:2018, CMMI Level 3, EDWOSB providing superior, affordable and innovative business management and information technology services to federal and private sector clients nationwide. We specialize in Software Development, Business Intelligence (BI), Data Management, Data Governance, Cyber Security, Data Quality, Master Data Management, Advanced Data Analytics and Cloud Services. Our services encompass data and statistical analysis, program integrity, system automation for analytics, data warehousing, quality control, enterprise portals and content management systems, configuration management, and full life cycle system development.



ABOUT THE CUSTOMER - USCIS

U.S. Citizenship and Immigration Services (USCIS) is the federal agency that oversees lawful immigration to the United States. They are a component of the Department of Homeland Security and provide services that include, Citizenship (Includes the Related Naturalization Process), Immigration of Family Members Working in the U.S. among others.

CUSTOMER MIGRATION TO A CLOUD-NATIVE MICROSERVICES ARCHITECTURE FOR A SECURE AND SCALABLE APPLICATION

Navitas worked with USCIS in migration and modernization of their platform which included application re-architecture, refactoring, and migration to AWS.

Key Challenge

- ✓ The modernization project was undertaken to enhance the ability of UCIS to detect, monitor and mitigate risk due to fraud.
- ✓ Monolithic architecture difficult to manage, scale and deploy across various components of the application
- ✓ Used Legacy COTS product with security vulnerabilities and scalability issues
- ✓ Manual and time-consuming deployments that were at times error prone.

SOLUTION

The application is a modernization project to migrate from a COTS on-premise application to AWS. This approach is built on the strangler pattern where small pieces of legacy systems are gradually replaced by modernized systems. The new application has been rearchitected to follow cloud native principles using containers and a microservices architecture

SERVICES USED

- ✓ EKS (Elastic Kubernetes Service): Used for deploying microservices using containers and a microservices architecture.
- ✓ MSK (Amazon Managed Streaming for Apache Kafka): Used for event streaming and batch processing use cases.
- ✓ RDS (Relational Database Service): Used for hosting PostgreSQL instances.
- ✓ Lambda: Utilized for batch processing and event streaming.



- ✔ CloudWatch: Used for monitoring application availability and performance metrics.
- ✔ Apigee: Utilized for API monitoring and metrics.
- ✔ CloudTrail: Enabled for tracking and monitoring API calls.
- ✔ S3 (Simple Storage Service): Used for object storage and data replication.
- ✔ Spot Instances: Utilized for stateless, fault-tolerant, and cost-efficient workloads.
- ✔ Step Functions: Used in combination with Lambda for optimizing memory configuration.
- ✔ Eventbridge: Employed for event-driven scaling and automation.
- ✔ KMS (Key Management Service): Utilized for data encryption and key management.
- ✔ Amazon VPC: Used for segmenting applications into different subnets.
- ✔ Secrets Manager: Employed for storing and managing sensitive information.
- ✔ Elasticsearch: Utilized for search and data analysis.
- ✔ Aurora: Used for highly available database clusters.
- ✔ Amazon OpenSearch: Used for search and indexing capabilities.
- ✔ ECS (Elastic Container Service): Used for hosting custom workloads and COTS tools.
- ✔ IAM (Identity and Access Management): Utilized for access control and security.
- ✔ AWS Backup: Used for backup and recovery purposes.

THE BENEFITS

- ✔ Accelerated Deployment Workflow: Achieved a 40% reduction in deployment time through the implementation of an automated CI/CD pipeline, resulting in faster release cycles and improved time-to-market.
- ✔ Enhanced Security Position: Strengthened security measures with the implementation of modern cloud-native services, leading to a 60% reduction in vulnerabilities identified and a 30% reduction in potential security breaches. Real-time monitoring reduced incident response time by 50%.
- ✔ Efficient Log Management: Reduced log analysis time by 70% by establishing a centralized log repository, enabling the identification and resolution of issues within 15 minutes on average, as compared to the previous 1-hour average resolution time.