

Modern resale platform on AWS

AWS Re-factor Modernization Case Study

Executive Summary

Recurate is a Series A startup (\$17.4M total funding amount) with a growing portfolio of clients. The company offers a resale platform for digital commerce and retail businesses. Recurate is growing fastly and with aggressive timelines. Therefore, the executive team has engaged with IO Connect Services to design and implement the next generation of the organization's resale platform offerings.

The Challenge

Recurate's MVP is a self-managed semi-monolithic containerized solution that requires constant server rebooting and manual scaling for the proper operation.

The multitenancy approach is rudimentary and delivers content to each client based on a column identifier in the database. This product is a single point of failure, as any application downtime affects all the clients, disrupting the service for everybody. Recurate needed to add more and larger clients to their portfolio. Therefore, a new solution was required to guarantee the company's success.

Why AWS

AWS has been the cloud vendor of choice of Recurate since the beginning. Although the initial architecture leveraged other SaaS to execute some of the use cases, Recurate knew there was much potential in using AWS for these and future use cases. Not only for the infrastructure and hosting point of view but as a cloud platform for application integration.

The extensive services offerings in AWS offered multiple options to execute different migration or modernization strategies. In this case, AWS Serverless technologies were perceived as the foundation to build the next version of the solution: services like AWS Lambda, Amazon SNS, Amazon SQS, Amazon API Gateway, and Amazon DynamoDB, among others.

About Customer

 recurate

Recurate is a tech-enabled resale service that empowers brands and retailers to establish their integrated resale platforms directly on their e-commerce sites. More customers. More sales. More sustainable.

Recurate focuses on designing a superior resale experience for customers that welcomes them into a brand's ecosystem. Their technology integrates with all e-commerce backends and works with each brand to get the look, feel, and functionality just right.

“AWS Serverless.”

Modern applications are built serverless-first, a strategy that prioritizes the adoption of serverless services so that you can increase agility throughout your application stack. AWS has serverless services for all three layers of your stack: **compute, integration, and data stores.**

The Solution

In IO Connect Services, we have a cloud-native manifest for startups that focus on business value and product KPIs to build technical solutions. We selected AWS Serverless to shorten development cycles and go to market timelines.

The new platform needed to warranty to offer a real SaaS B2B (business to business) solution. Therefore, we design the new architecture with the following principal requirements:

- 1) Each tenant will be isolated from the others, and the data and other assets will be unique and only accessible to that tenant.
- 2) A new client should be onboarded in days independent of the geographical region, with a target of minutes in future phases.
- 3) A particular tenant may have customizations in business logic and composing integrations.
- 4) A new feature should be available for customizable tenants and be automatically released to standard client accounts.
- 5) SLAs and performance metrics must be standard for all tenants; a higher utilization client must not impact other accounts.
- 6) All transactions must be auditable.

We managed the new solution as a green field scenario to start fresh. We decided to implement a multi-account mechanism to address the multitenant-related requirements. We provision an AWS Account per B2B client. AWS Organizations was set up with AWS Control Tower to govern all the accounts. With this approach, each tenant is isolated in their account without sharing data access and without competing for service limits and other resources. Moreover, this tactic reduces the blast radius of vulnerabilities and threats and eases the complexity of compliance by providing mechanisms to separate access to resources.

This solution’s architecture design, focused on AWS Serverless, allowed a quick-start and a highly available platform to work on. One of the main topics on the selection of serverless world is that you get availability out of the box. All services provide high availability capabilities and in most cases either autoscale or provide easy configuration to handle workloads. The design had an API-led first approach with a Microservices architecture implemented with Amazon API Gateway and AWS Lambda. We used queues and publisher-subscriber mechanisms with Amazon SQS and Amazon SNS to decouple transactions and to warranty consistent SLAs. All the Lambdas were orchestrated with AWS X-Ray, and activity logs were submitted to Amazon CloudWatch Logs to provide accurate traceability and to do troubleshooting analysis and auditing.

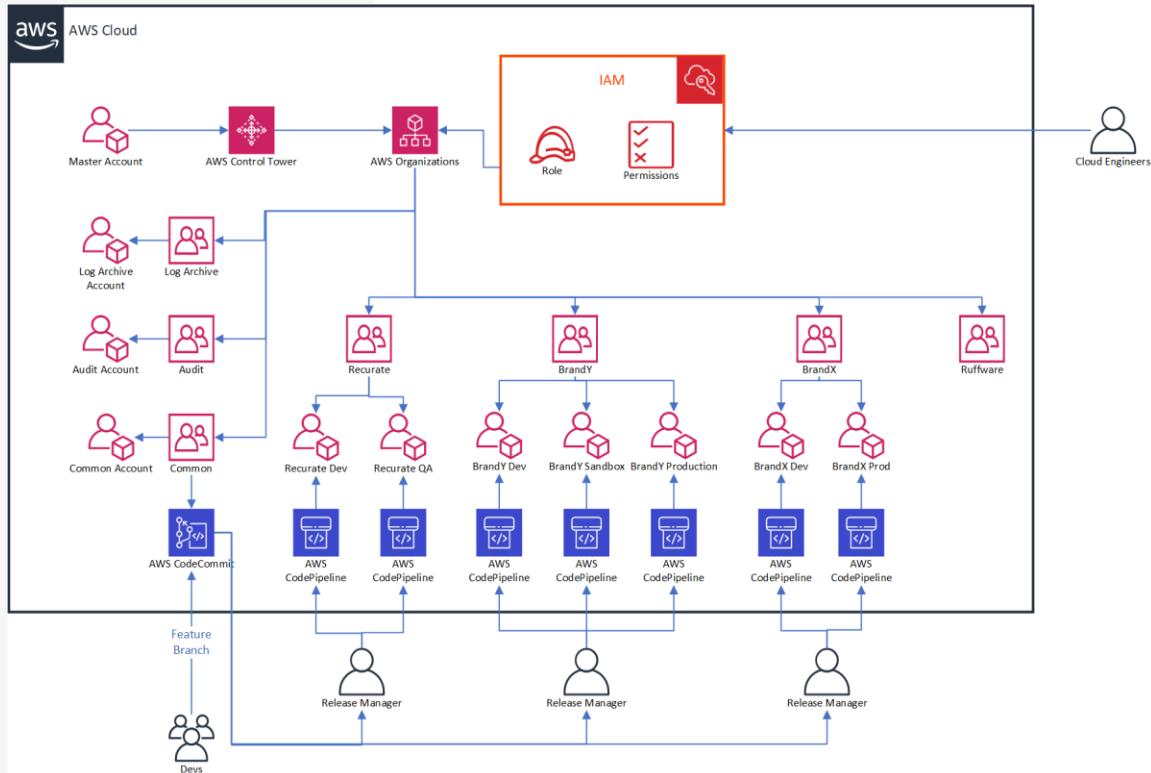


Figure 1. Figure 1. Multi-account approach with AWS Organizations, AWS Control Tower, and CI/CD Pipeline setup.

Best features of AWS Serverless Solution

- Reduced Cost
- Elastic scalability
- Available and durable
- Faster Releases
- Multi-Language support

We selected a No-SQL database to keep constant writing and reading times and to keep the schema flexibility of the data to be stored, as some premium clients could use different data models. Eventual consistency was a crucial factor in designing asynchronous transactions that could help scale the volume substantially.

To ensure fault tolerance and no data loss during the execution of the microservices, each Lambda implemented a unit of work transaction pattern, and each queue had a corresponding DLQ (dead-letter-queue) to save and quarantine the transaction in case of any failure. A specific message can be replayed without affecting the rest of the business logic. Plus, we have established backup plans for DynamoDB tables and S3, allowing us to recover the service in case of any eventuality.

Our DevOps team created CI/CD pipelines to rapidly deploy new code consistently using AWS CodePipeline and AWS CodeCommit as a Git repository for code and template versioning. Also, we implemented IaC (infrastructure as code) approach to provision assets in AWS consistently and automatically.

Results and Benefits

Because all workloads were designed following a serverless approach, all the code generated focuses solely on business needs rather than infrastructure or other non-business-related functions. Using serverless shortened development cycles, the project delivery was on time despite the aggressive deadlines and some last-minute changes in requirements.

All this, with high availability and fast recovery from failures.

We ran a load test to provide consistent numbers in throughput, and the results were as expected based on the architectural and design patterns. Each tenant account can handle gracefully more **than one thousand transactions per second** (1K TPS). Each request besides JSON payload included a couple of images sizing 2 Megabytes per request. These numbers were reached without requesting service limits in any of the services used. Therefore, Recurate is confident that the platform can easily handle hyper-scaling volumes.

A few premium global clients were onboarded in a few days; one deployed in a European region for the UK market. The solution is GDPR-ready and provides a significant advantage to winning new businesses in the European market. Also, the multi-account flexibility allows the client to service faster digital content to the users in regions closer to them.

Recurate is confident to onboard new clients rapidly. The leadership team is optimistic that the new solution is bringing them to the next level as an organization. They are ready to fast-track new founding rounds with better and proven results.

Next Steps

There are some requirements to address yet and others evolving over the team. The main objective is for new clients who want to enable the resale platform with a “one-click deployment” for standard accounts and days or a few weeks in customizations for premium accounts. Although the foundations of IaC with the CloudFormation templates are available, more automation is required to achieve such a goal.

Evolving requirements for more sophisticated BI (business intelligence), data analytics, and potential ML (machine learning) use cases will be foreseen soon. Also, Recurate wants to implement more integrations with other commerce platforms to provide more native integration without any code needed.

Superior Performance

This Serverless approach provides a fast, resilient, and high availability environment for the application.

LOW TCO

Save money by replacing physical hardware with expensive license fees, with AWS you pay for what you use.

Fully Managed

With fully managed resource provisioning, maintenance, and backup, deployments are more efficient and secure.

About IO Connect Services

IO Connect Services is a company specializing in Information Technology Consultancy Services. All our team members have one thing in common: our enthusiasm for technology and our passion for customer service excellence. We provide services in all North America, LATAM and Europe. Our headquarters are in NYC metropolitan area, and we also have offices in Guadalajara, Mexico and Madrid, Spain.