# API Management: Ticket Purchasing System on AWS
## AWS Retail Case Study

### Executive Summary

**MOBILITYADO** has defined its digital transformation strategy to reach its new 2027 vision: to become a global mobility company. In this journey, one of the first steps was to update the application's fronts of each business vertical: urban, long-distance, tourism, personalized services, and public services, seeking to build standard products that include data and technology and can be replicable in any operation at the global level.

This global platform aspires to offer comprehensive and multimodal experiences, combining services operated by **MobilityADO** and third-party services and disseminating its offer to third parties. As part of this vision, the API Management system is a core element of their ecosystem.

### The Challenge

The challenge was to build and manage an API integration on AWS that functions as the best bus ticketing service in the general market. The Client had chosen the Oracle Cloud as their initial business strategy. **MobilityADO** is Oracle's client and consumes several of Oracle's services, so it looked like the natural choice. However, when the API Management's implementation took place over the Oracle Cloud (as part of their Digital Transformation). They noticed that the Oracle Cloud was not mature enough since the API Management implemented over the Oracle Cloud generated several operation problems like outages exceeding SLAs. The lack of resilience, performance, and HA evidenced issues in the design architecture. Likewise, the client noticed that the Oracle Cloud Architecture did not have AWS' Global Infrastructure capabilities to become one of the best ticket purchasing systems worldwide.

### Why AWS

All the AWS capabilities were demonstrated during the POC (Proof of Concept). **MobilityADO** tested and validated the services that could be used for implementing their API Management over the AWS Cloud. AWS could provide better elements. They were searching for a robust, secure, and fast API Management to continue with the goal of achieving the highest possible ticket sales compared to last year and more reliability. Replacing the API Management running on the Oracle Cloud with a new Serverless approach running on AWS can achieve a more efficient e-commercial system.

### About Costumer



**MobilityADO** is a global company founded in Mexico, an expert in comprehensive mobility solutions with a presence on two continents.

Mobility ADO has more than 8,000 buses, more than 26,000 collaborators, more than 280 BRT vehicles, more than 50 brands, and more than 500 million passengers are transported annually.

**"Mobility is another way to say freedom."**

## The Solution

The API Management running on the Oracle Cloud had several operational and design issues reported by the users besides the end-user complaint about the bad performance. IO Connect and **MobilityADO** agreed to perform a re-factor migration of the API Management, so our team worked on a Serverless approach, re-designing, re-architecting, retiring the current one, and replacing it with a new cloud-native application using AWS technology.

Since AWS offers technologies for running code, managing data, and integrating applications, all without managing servers, the Serverless approach was the best decision to make.

Serverless technologies feature automatic scaling, built-in high availability, and a pay-for-use billing model to increase agility and optimize costs. These technologies also eliminate infrastructure management tasks like capacity provisioning and patching so that **MobilityADO** can focus on writing code that serves their customers.

A Serverless approach was designed, presented to the client, and approved. Amazon API Gateway was the core service of the API Management and the Lambdas functions were in charge for integration and the business logic.

**"AWS Serverless"**

Serverless applications start with **AWS Lambda**, an event-driven compute service natively integrated with over 200 AWS services and software as a service (SaaS) applications.



Figure 1 - AWS Serverless Services

## Features of the AWS Serverless Solution

- Efficiency in Ticket Purchasing

- Reduced Cost

- Scalability

- Faster Releases

## Results and Benefits

Deploying the solution with Serverless technologies provided better integration with the payment systems used through various previously created APIs. Other benefits were automatic scaling, high availability, and a pay-as-you-go model to increase agility and optimize costs. These technologies also eliminate infrastructure management tasks such as capacity provisioning and patching while allowing you to extend the capabilities of current APIs by implementing additional AWS services such as CloudFront, WAF, Route 53, and CloudWatch. The core aspects of the MobilityADO Serverless approach were:

**Efficiency in Ticket Purchasing**
An improved ticket purchasing system to enhance the e-commerce environment and improve user experience.

**Quick Releases**
Eliminate operational overhead so MobilityADO teams can release quickly.

**Scalability**
With technologies that automatically scale from zero to peak demands, MobilityADO can adapt to customer needs faster.
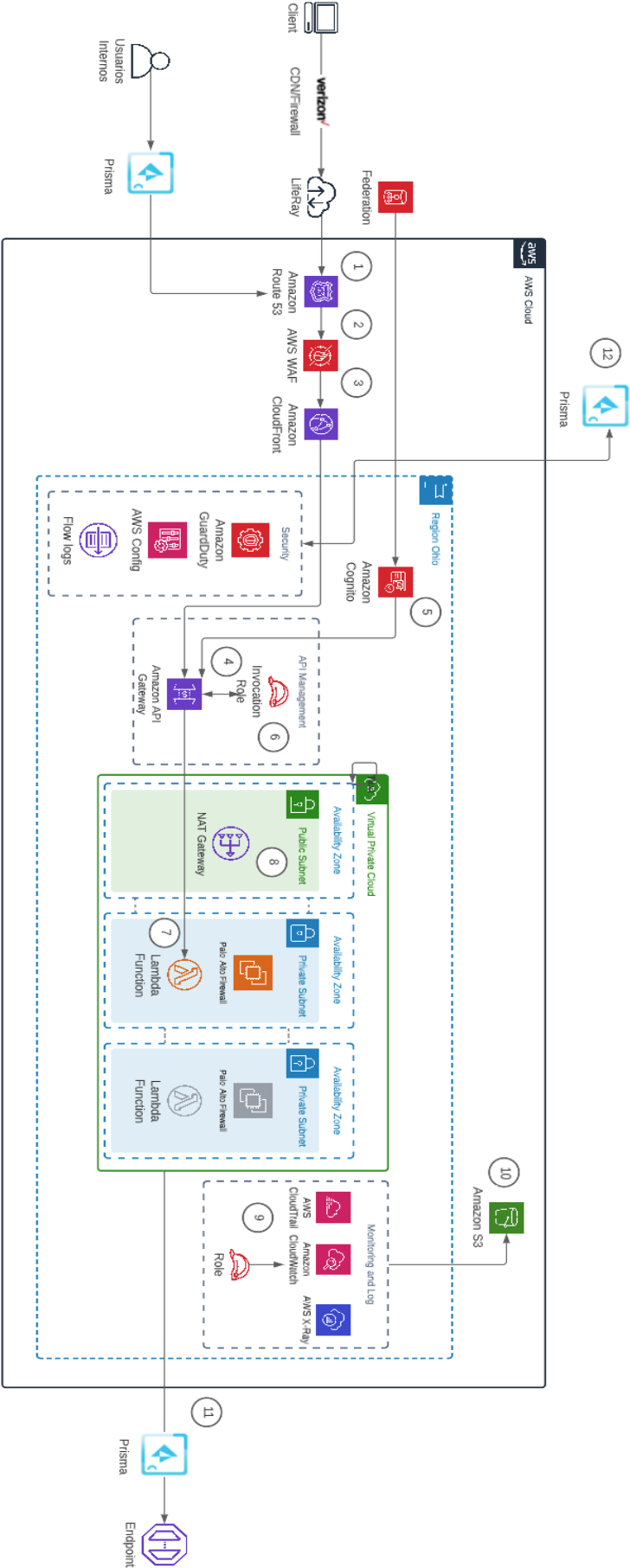
**Lower Costs**
With a pay-for-value billing model, resource utilization is automatically optimized.

**Easier to Build**
Serverless applications have built-in service integrations, so MobilityADO can focus on building their applications instead of configuring them.

**MobilityADO API Management Migration Solution Diagram**

Client
CDN/Firewall
verizon
LifeRay
Federation

Usuarios Internos
Prisma

AWS Cloud

1 — Amazon Route 53
2 — AWS WAF
3 — Amazon CloudFront

12 — Prisma

Region Ohio

Security
Flow logs
AWS Config
Amazon GuardDuty

Amazon Cognito
5

API Management
Amazon API Gateway
4 — Invocation Role
6

Virtual Private Cloud

Availability Zone
Public Subnet
NAT Gateway
8

Availability Zone
Private Subnet
Palo Alto Firewall
Lambda Function
7

Availability Zone
Private Subnet
Palo Alto Firewall
Lambda Function

Monitoring and Log
AWS CloudTrail
Amazon CloudWatch
AWS X-Ray
Role
9

Amazon S3
10

Prisma
11

Endpoint

## Next Steps

For **MobilityADO**, this was their first project on the AWS Cloud. They monitored and measured the results as well as the user's response. After the revision, the client considered the project a successful migration. Due to the success of the implementation, the client is considering migrating other workloads and services like databases and other lines of business to AWS.

## 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 only pay for what you use.

## Fully Managed

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

## About IO Connect Services

IO Connect Services is a nearshore Cloud Solutions Consultancy specializing in Digital Transformation, Migration and Modernization, Cloud-Native Development, DevOps, and Security. Our headquarters are located in the NYC metropolitan area, and we also have offices in Guadalajara, Mexico, and Madrid, Spain. We provide services in North America, LATAM, and Europe.