

Mobile App Backend using AWS and DevOps



Executive Summary

Shaurya Technosoft Pvt. Ltd. is a Pune (India) based company. It is one of the fastest growing software company. They build software and provide advance technology services to their customers that add values to their business. They cater to the technology requirements of the Dairy Industry, Manufacturing Industry, Defense Sector, e-Governance, Mining Sector, Vehicle Tracking and Agricultural Sector. The other domains include Election Management, Inventory Management and Animal Husbandry. Shaurya Technosoft also undertakes offshore projects of software development.

The Challenge

The core objective for this project was to build backend and micro services for the platform which would principally monetize empty return trips of transporters by offering a marketplace to maximize profit for transporters.


For this project, the company wanted the backend to have all modules that would be required for a transportation app. This included master data, transaction modules to hire truck hiring, truck availability, notifications, order cancellations, provision for ratings. They wanted the core platform to be able to handle growing data and scale, data backbone to be able to handle 20 million vehicles (at the peak), and their GPS data to be quicker as the platform scales. Overall, they wanted the platform to be extremely performant.

During the initial investigation, they found it challenging to find off-the-shelf integration solutions that could handle ever growing data, without having to worry about scaling issues and associated costs.

AWS Cloud and DevOps – Key ingredients to SaaS platform

As innovation accelerates and customer needs rapidly evolve, businesses must become increasingly agile. Time to market is key, and to facilitate overall business goals, IT departments and aspiring startups need to be agile. Over the years software development lifecycles moved from waterfall to agile models of development. These improvements are moving downstream with the evolution of DevOps. To meet the demands of an agile business, agile development teams need to deploy applications in a consistent, repeatable, and reliable manner. This can only be fully achieved with the adoption of automation. Amazon Web Services (AWS) supports numerous DevOps principles and practices that IT departments can capitalize on to improve business agility.

A Pune (India) based fastest growing software company providing advance technology software solutions and services that adds values to their customer business.



With AWS, one can take advantage of a scalable, reliable, and secure global computing infrastructure. Using AWS tools, Auto Scaling, and Elastic Load Balancing, application can scale up or down based on demand. AWS provides fastest way to get answers from all your data workloads with personalized search experience, allowing to quickly find relevant data, for your applications and websites.

As a leader in cloud and its role in supporting many startups (including transportation behemoths like OLA and UBER), we strongly recommended AWS as cloud provider for the backend platform.

QloudX Solution

Our solution uses a serverless, rule-based application with full microservice architecture.

A suite of AWS tools and services were critical to build this solution, including:

Serverless and
Amazon Elastic
Container Service

A serverless computing services was used to provide highly secure, reliable, and scalable containers based ECS solution. It allowed EC2 Spot instances to realize up to 50% discounts compared to on-demand prices for running stateless and fault tolerant applications.

AWS Lambda

Used to power the core business logic for a rule-based integration solution. It performs all the administration of the compute resources, capacity provisioning and automatic scaling, code and security patch deployment, and code monitoring and logging.

Amazon Aurora

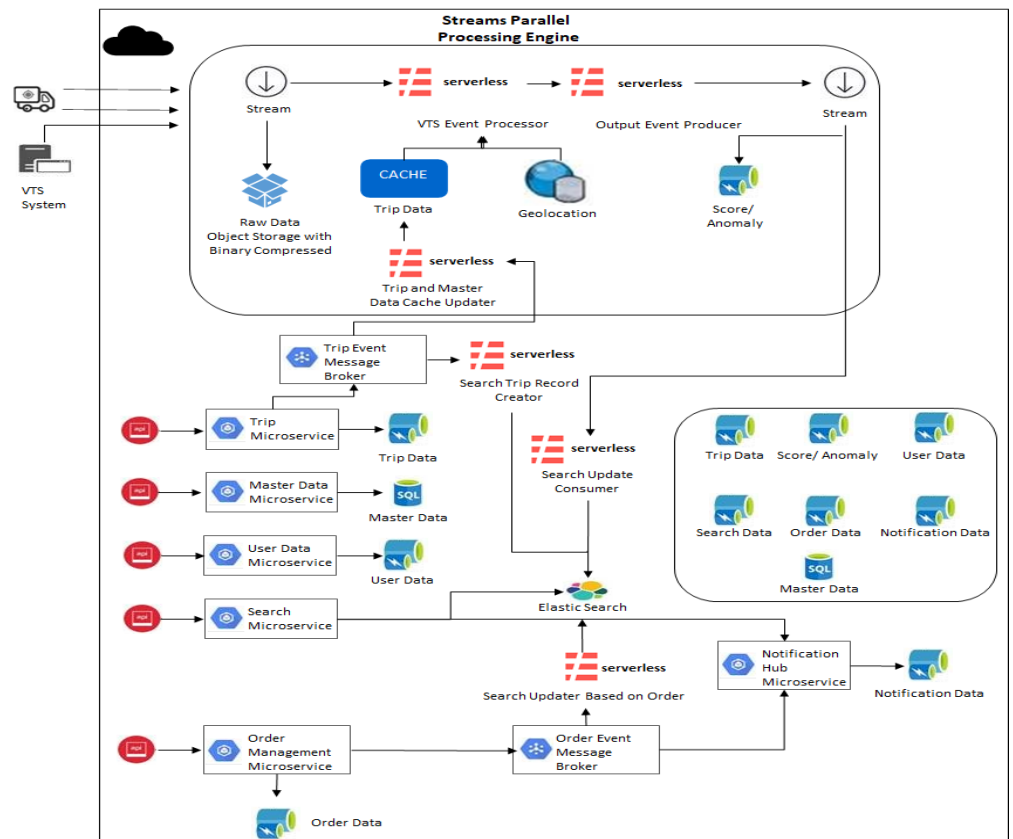
A MySQL compatible relational database, built for cloud, was used to store structured data to ensure performance and availability of commercial-grade databases at 1/10th the cost.

Amazon Kinesis Data
Firehose

Used for real-time data streaming, data capture, transform, and load into AWS DynamoDB using Microservices from multiple sources such as Truck, GPS, Trip, Order, Search, Web and Mobile App and is scalable and durable.

AWS DynamoDB and
Amazon Elasticsearch

Used DynamoDB as centralized repository to store all structured and unstructured data providing low-latency data access at any scale to the application paired with Elasticsearch to provide fast, personalized search experience to the applications, allowing users to quickly find relevant data.



DevOps

A full DevOps pipeline was assembled using AWS CloudFormation, Atlassian Jira and Atlassian Bitbucket, AWS CodeCommit, AWS CodePipeline, AWS CodeBuild, and AWS CodeDeploy while the application is being hosted and run in AWS.

Atlassian Bitbucket was used as a source code repository for teams to collaborate easily in a secure and highly scalable ecosystem. Code repositories sync implemented using lambda from Bitbucket to AWS CodeCommit

AWS CodePipeline was used to manage a continuous delivery service to help automate the release pipelines for application and infrastructure updates.

AWS CodeBuild was used to build and test code in the cloud with continuous scaling.

AWS CodeDeploy was used to manage deployment services to automate software deployments to eliminate error-prone manual operations.

CodeStar would be used in future to further improve continuous delivery requirement along with integrated issue tracking capability powered by Atlassian Jira.

Infrastructure Automation with CloudFormation

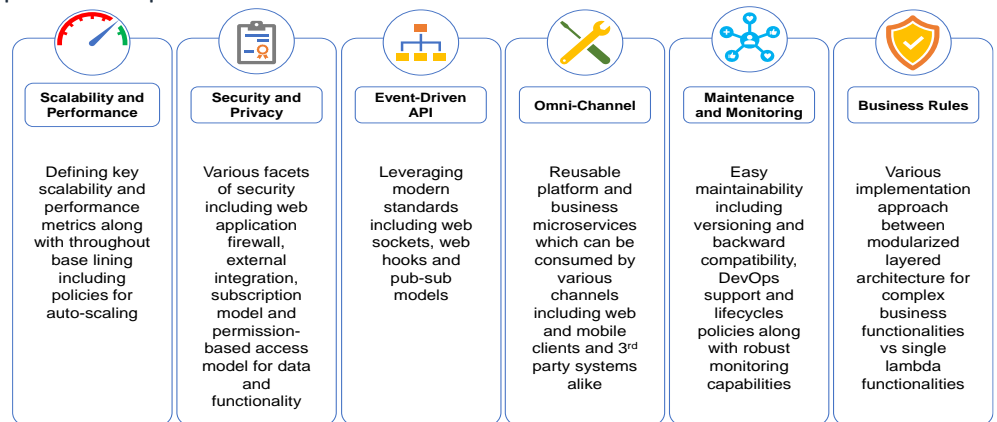
AWS CloudFormation was used to provision various AWS services and infrastructure. As part of DevOps processes, we ensured all the resources are provisioned using the CloudFormation template.

A Solution that creates Value & Benefits

Rent a Truck platform was built for longevity and low operating cost by anchoring strategy decisions and technology components around the Amazon Well Architected Framework and key drivers. A properly architected modern cloud native solution was envisioned that will have a long lifespan, to ensure it is continually evolved, enhanced, and refreshed.

Additionally, internet facing, multi-user, omni-channel platform comprising of Web and Mobile app need to constantly evolve to meet changing security requirements, changing user requirements, changes in UI standards and design norms, and evolving cloud technology capabilities almost daily.

Below are some of the core standards and principles followed for achieving these platform requirements.



Since microservices (including both business services and data flow integration services) and cloud native databases of DynamoDB and ElasticSearch were the most critical components it was imperative that DevOps played a major role to ensure high quality platform output including automated infrastructure, Code Management and Deployment, containerized solutions for the business services and serverless lambda for data flow management.

The project was completed and deployed in production in less than 4 months and currently pilot is being run with select partners.

Below were key benefits achieved

1. Absolute minimal infrastructure hosting costs due to containerized and serverless solution along with cloud native databases.
2. Easier change management due to strong Atlassian suite and AWS DevOps tools including CodeCommit and CodeBuild/CodeDeploy.
3. Zero down-time service deployment.
4. Project Delivery time reduced from over a year to 4 months.
5. Modern User Experience with service response times always within few hundred milliseconds.

About Systems Plus & QloudX

Systems Plus is a niche IT solutions company that has been in business for over 30 years providing services to its clients globally. In 2019, the Systems Plus Group launched **QloudX**, a next generation cloud company that focuses on all things cloud and helps all businesses across the globe to leverage cloud technologies in order to maximize value for their digital transformation journeys.

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