



# Modernization of Electronic Pre-Delivery Inspection on vehicles Application for Japanese Multinational Automobile Manufacturer

## Overview

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Enterprises are leading the cloud transformation path by implementing cloud-native services provided by AWS. Microservices are an important part of this transition path. When combined with cloud-native services such as container-based microservices (running on Kubernetes), Aurora Postgres, Lambda, and CloudFront, these designs provide scalability, reliability, and resource efficiency, resulting in cost optimization. TechM enabled one of the automobile companies to effectively update a monolithic application into a Microservices-based solution, which enabled flexibility, scalability, reliability, and resource efficiency, while also enhancing the dealer experience.

## Client Background and Challenge

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The Japanese multinational automobile manufacturer has expertise across the region in research and development, vehicle exports, automotive design, engineering, consumer and corporate financing, sales and marketing, distribution, and manufacturing.

Migrating application architecture for electronic pre-delivery inspection for vehicles hosted on NDC server in a monolithic architecture to microservice architecture and hosted on AWS was a priority for our customer. Given the drawbacks of using a monolithic approach in terms of scalability and reliability, the solution was proposed to move to a microservice approach with AWS to help meet the customer expectations in terms of reliability and scaling. It had become difficult for the customers due to constant load from dealers affecting the performance and application reliability was raised as a concern.

## Our Approach and Solution

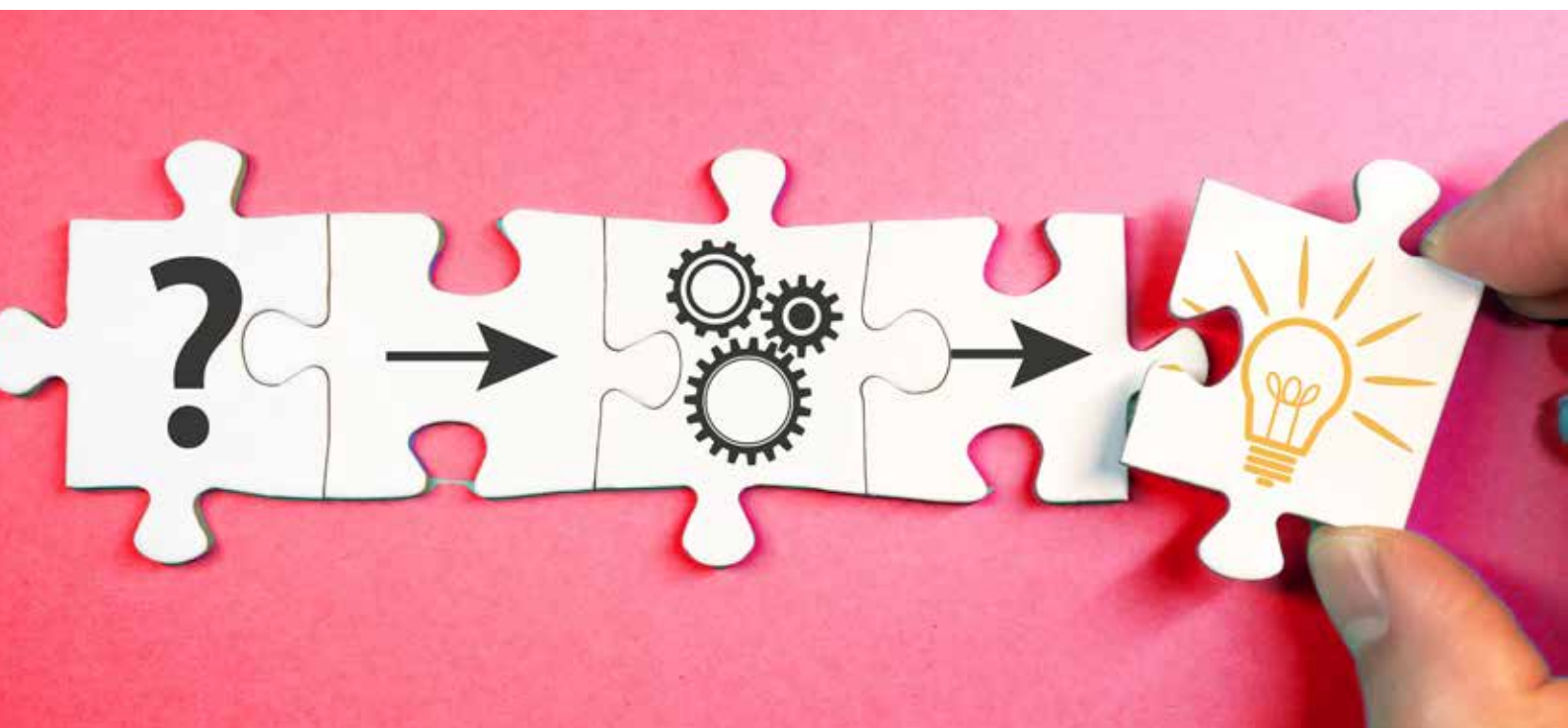
We proposed a custom solution to handle all these challenges. With all the moving parts, it was essential to draft a migration strategy that would consider all aspects of the migration. This strategy outlined the rules of engagement for the project and provided a clear roadmap for project execution. It included infrastructure requirements, Data migration, application migration (across multiple non-production and in production environments) from a monolithic based approach to microservices, ETL integrations using IICS and the overall scope of all the individual components that are part of the migration. Paramount was to create a parallel production like environment (database and application infrastructure) for the migration team to work independently on AWS.

Creating a parallel environment provided the team with a platform to try various solutions with respect to the microservice based approach. It was easy to replicate and build a new environment in AWS for all the components based on the existing infrastructure. This accelerated testing, Quality assurance and provided alternate means for live monolithic project to be on par with their project schedule yet be accommodating with migration project timelines. Based on complexity and interdependency between the monolithic approach in the development we had to perform the migration with the microservices and the components in the new infra environment.

AWS DMS jobs were provisioned with optimum capacity to ensure a complete data migration with minimal impact to customers. DMS jobs were executed multiple times with production like data; fine-tuned with various performance improvement techniques to ensure we had success at the first shot during cutover. ECS helped in the hosting of sophisticated application architecture on a microservices model. API Gateway and Cognito helped in the authentication of each request from the web and mobility end users. Cognito was able to connect using identity pool to customer's secure-auth platform for validation tokens which simplified the process to handle the existing user validation. Usage of CloudFront helped in processing the static content to dealers efficiently. WAF Rules were enabled to protect the application from vulnerabilities and increased security.

With increasing demand for cost effective, high performing and scalable databases for the future, it was most appropriate to choose an RDBMS like Amazon Aurora Postgres to meet this objective. Amazon Aurora is a relational database service that combines the speed and availability of high-end commercial databases with the simplicity and cost-effectiveness of open-source databases. The AWS Aurora pricing model follows the on-demand model. It was easy to configure failovers and leverage the advantage of AWS cloud offering when it comes to scalability, monitoring and observability and security. AWS database migration service simplified migration process for us and enabled us to accelerate our migration efforts.

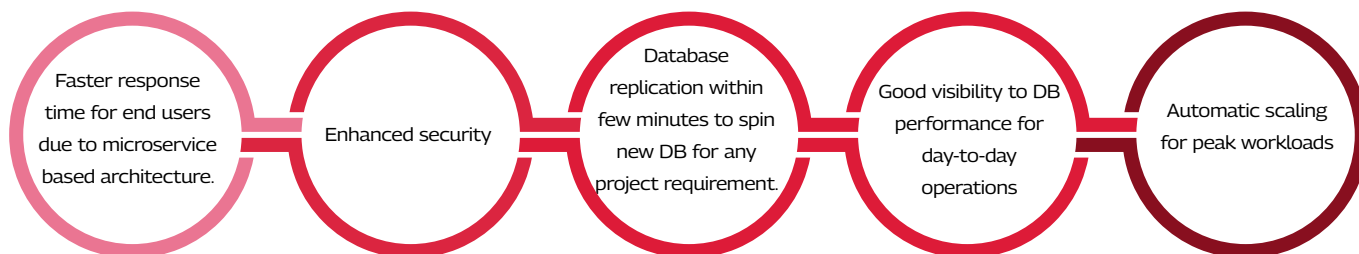
For a migration of this nature, a thorough understanding of current architecture, microservices, AWS Infra pipeline, Postgres performance tuning techniques and prior experience in drafting and executing a solid cutover plan considering all variables were essential for the success. As part of this project, Tech Mahindra migrated the application from on-prem DC to AWS as a whole and has improved the existing architecture of the application which led to customer satisfaction.



## Business and Community Impact

- Minimal down time as part of the migration (6 hours during maintenance window)
- Better control and visibility of the application
- Highly scalable configuration for the future
- Dealers are seeing faster response time from application
- Considerable Savings in database licensing costs
- Microservices based approach helped in easy maintenance

## Technical Benefits



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