

# Cloud Migration Factory

AWS Migration Microservice Application

Automotive Customer

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# AWS Migration

## CUSTOMER — International automotive OEM

The customer is an international automotive OEM, operating a financial middleware system which facilitates handling of backend accounting and invoice generation for the customer's various shop systems. The solution encapsulates the logic for complex tax calculations done for countries around the world and further ensures that the invoices generated are booked in a legally correct way. The solution is further used to distribute relevant billing information to internal departments and 3<sup>rd</sup> party providers. In the past, the solution frequently ran into resource and performance bottlenecks due to constraints of the customer's on-premise hosting facilities.

## CHALLENGE — Scalability, scalability, scalability, oh .... and security!

One of the biggest customer's asks was fast and efficient scalability of the solution. Initially, the application had been developed to serve only a single geography and deployed on infrastructure that was already scheduled for end-of-life. Due to a planned rollout in additional markets world-wide, the customer expected an increasing number of users and higher TCO for the solution. In order to find a feasible solution, the customer reached out to MHP.

As MHP saw the workload being a perfect fit for the cloud and the customer's IT strategy favored a shift towards more cloud-based deployments, the solution was selected to undergo a business case study and technical analysis to evaluate the tradeoff of migrating to the cloud. Since the customer not only had to plan ahead for higher load and deployments in different parts of the world, but also had to make sure that the chosen cloud provider could ensure the highest security standards for the processed financial data, AWS was selected as hyperscaler of choice.

## SOLUTION – Moving to the cloud... in a container!

When migrating applications to the cloud, MHP resorts to the classic 3-stage approach consisting of the phases "Assess", "Mobilize" as well as "Migrate & Modernize". Starting with the **Assess** phase, the MHP team started to elicit a status quo of the current landscape by

doing architecture workshops with the customer, as well as compile the high-level business case for a move to the AWS cloud versus staying on-premise. The customer already had a good understanding of cloud transformation, but ultimately wanted to determine if the workload in question was suitable for the migration and, also, select the best migration strategy according to the 7Rs. The customer's overall posture with respect to a cloud migration was evaluated by means of a Migration Readiness Assessment (MRA). Reviews of the solution's current architectural state revealed, that it followed a Java-based microservices setup operated on an open-source platform, which also acted as a service broker for accessing the respective services' data layers consisting of MongoDB and MySQL databases. End-user requests came in over REST-calls. Based on this information, as well as cost information supplied by the customer, a high-level business case for different eligible migration strategies was projected and presented.

As the customer found the numbers for a re-platforming approach most compelling, the MHP team transitioned the project into the **Mobilize** phase and created a proposal for a possible migration wave and helped in selecting a workload for an initial pilot migration. For the latter, the customer eventually chose to migrate the solution's full development stage, as opposed to individual parts, since only the full roster of microservices would have been able to give a clear picture of how the performance on AWS would look like. The individual microservices were containerized and moved to an Amazon EKS cluster on AWS Fargate, while the solution's data layer and networking components were migrated to AWS managed services. Additionally, the customer was instructed by MHP on how to set up an AWS account structure and according control mechanisms to meet all governance and security requirements. On the network level, the initial application was deployed in a single region, but made use of multiple Availability Zones, in order to provide zone failure resilience. After first load and penetration tests (performed by a 3<sup>rd</sup> party) to assert the pilot workload's scalability and security, followed by detailed cost projections for the new cloud architecture, the pilot migration was deemed a success and the customer gave the MHP team the greenlight to move the remaining stages of the workload.

In scope of the **Migrate & Modernize** phase, the solution's remaining stages including production were moved to the cloud according to MHP's Cloud Transformation Factory migration workload patterns (People, Tools, Runbooks, Processes) and AWS Prescriptive Guidelines were applicable. Ultimately, the final architecture consisted of a combination of the following services:

- **Amazon EKS on AWS Fargate** for running containerized version of the original microservices
- **Amazon DocumentDB** as managed service for the original MongoDB instances
- **Amazon RDS for MySQL** as managed service for the original MySQL instances
- **Amazon API Gateway** as managed service for a RESTful API and single point of entry
- **AWS Application Load Balancer** for routing the REST traffic to pods in the EKS cluster
- **Amazon Route53** as managed service for DNS and zone management
- **AWS Certificate Manager** issuing and renewing TLS Certificates

The network structure was designed in order for an extension to additional Regions is easily feasible. Amazon API Gateway was furthermore federated with the customer's central identity provider to increase security posture.

After detailed assessments and consideration of all AWS and MHP best practices, as well as financial industry standards, the MHP project team ensured that the application fulfills all pillars of the AWS Well Architected Framework (WAR). Finally, MHP planned for future optimizations based on a DevOps approach that would include scheduled and non-scheduled Well-Architected-Framework Reviews, as well as continuous load-, performance- and penetration tests.

## OUTCOMES – The sky is the limit with AWS cloud

Final 3<sup>rd</sup> party performance tests revealed, that the new cloud-native, purpose-built and serverless paradigm-based architecture reduced the customer's operating cost by 30%-40%, while at the same time offering better maintainability and increased availability. Most importantly, the migrated solution was able to deliver the necessary higher performance and scalability that the original on-premise deployment could not deliver. An adaptable network design, that currently enables the solution's multi-AZ deployment, also allows extending the solution to a multi-region deployment, once the customer needs to implement it. Lastly, final

penetration tests and security reviews indicated an even stronger overall security posture of the solution. By leveraging AWS cloud infrastructure, the migrated solution now serves as a centralized platform for globally distributing billing information in a secure manner at scale.

## ABOUT THE PARTNER – “ENABLING YOU TO SHAPE A BETTER TOMORROW”

Functioning as a technology and business partner, MHP digitalizes its customers’ processes and products, and guides them through IT transformations along their entire value-creation chain. MHP is a digitalization pioneer for the mobility and manufacturing sectors with expertise that can be transferred to a wide range of industries. MHP is a distinguished AWS partner, currently holding the Advanced tier status and offering Consulting as well as Software services to its customers. Additionally, MHP is a member of the APN Immersion Day program as well as AWS Well-Architected Partner and to date obtained more than 10 AWS Service Delivery Program Validations (SDPs), two of which MHP achieved as a launch partner.

MHP serves over 300 customers worldwide, including large corporations and innovative SMEs. MHP advises on both operational and strategic issues, offering proven IT and technology expertise as well as specific industry know-how. MHP operates internationally as OneTeam with headquarters in Germany and subsidiaries in the USA (since 2011), UK (since 2016), Romania (since 2014), and China (since 2013).

The MHP Group has been shaping the future alongside its customers for over 25 years. The MHP team of over 3,300 employees is united by the company’s promise of excellence and sustainable success. This promise continues to drive MHP – today, tomorrow, and in the future.

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