

Royal Caribbean Delivers a Personalized Guest Experience in Real-Time on Land and Sea with Mesosphere

Introduction

Today's consumers are constantly tethered to their smartphones and they expect companies to provide experiences that are highly personalized and in real-time. As a result, modern businesses need to find a way to accommodate their customer's preferences for easy access to information and services.

That was the situation facing Royal Caribbean Cruises, Ltd., a global cruise vacation company controlling and operating four global brands: Royal Caribbean International, Celebrity Cruises, Azamara Club Cruises and Silversea Cruises. Combined with its 50% joint venture ownership in the German brand TUI Cruises and its 49% holdings in the Spanish brand Pullmantur Cruceros, the company operates a combined 59 ships worldwide. In 2017, it generated \$1.6 billion in revenue.

Royal Caribbean Project At-a-Glance

Customer

Royal Caribbean Cruises, Ltd.

Industry

Travel

Challenge

Enable innovative guest experiences on both shore and ship using legacy technology

Solution

Mesosphere DC/OS Enterprise

Impact

Infrastructure modernization, improving customer experiences, and unlocking new revenue streams

Known for driving innovation at sea and beating out their competitors, Royal Caribbean has embraced digital transformation internally and externally. Having already unveiled a predictive route optimization system that helps ship captains choose the best route, Royal Caribbean turned its sights to transforming the passenger experience.

Royal Caribbean's vision was to make information and services available in real-time on mobile in order to reduce typical travel friction and frustrations, and allowing more time for adventure and exploration.

To get there, Royal Caribbean needed to modernize its technology infrastructure.

Challenge

Enabling a Modern Cruise Experience with Legacy Technology

Each year, Royal Caribbean spent over a million dollars in printing costs across its fleet to inform guests of daily ship activities and offerings. Each day, if guests wanted to book an activity or add on a special food and beverage package listed in a brochure, they had to stand in line and see an on-board concierge to make that purchase. And, by the time they got to the front of the line, there was no guarantee that what they wanted would even be available.

Few vacationers want to spend their time this way and the cruise line risked lost revenue from those not willing to stand in line. Complicating matters was the need to accommodate guests on both shore and ship.

At the core of Royal Caribbean's technology stack is its legacy reservation system. To enable modern, mobile experiences for passengers, the cruise line needed a way handle mobile traffic and extract data from their legacy system—without a complete rip and replace. Plus, data needed to be orchestrated across both land and sea—which is no small feat.

The team at Royal Caribbean knew it needed a microservices-oriented architecture in order to maintain the cruise line's competitive edge, requiring the need to solve for these unique challenges:

- **Limited bandwidth to sync data across ship and shore:** Most of the ship's 300 Mb satellite connection is allocated to critical on-board guest services. Plus, the systems needed to support real-time information like weather and guest reservations.
- **Limited on-board IT support:** The IT team on the ships had limited technical skills, so the system needed to be self-healing and enable an automated cloud-like experience that allowed admins to connect remotely to a system that behaves exactly as expected.

- **The functionality of the datacenter without the square footage:** Building customer 360 profiles in real-time required serious compute power without sacrificing space for guest amenities in order to build an on-board datacenter.
- **Zero downtime for upgrades:** Cruise ships spend limited time at port and needed that time to sync customer profiles and systems of record on land. Any downtime to accommodate an upgrade could delay voyages and be very costly.

Royal Caribbean faced significant infrastructure and operational challenges due to both the distributed nature of its fleet of ships as well as reliance on numerous legacy systems. Moreover, some of the fleet's systems existed on shore while others only existed on ships. Yet Royal Caribbean needed to accommodate many data scenarios, especially since a mobile application can be used both on shore and on ship. As such, its engineering team chose EY (Ernst & Young) as their digital transformation advisor to help them design a modern technology platform that could create a unified footprint from ship to shore.

Solution

Navigating a Complex Technology Landscape with Mesosphere

Royal Caribbean aimed to build a digital hub that would define a smart middleware layer providing agility, resiliency, scalability, and improved performance. To that end, EY conducted an assessment to determine what was needed to run microservices and ensure a standard

ship/shore footprint. EY knew Royal Caribbean couldn't run a cloud on its ships due to space constraints and a limited IT skill set. The cruise line needed an easy-to-use solution that made it possible to deploy the same code on ship and on shore. This solution also needed to provide the same experience for all users.

The key was leveraging a microservices architecture and modern integration technology. Although it considered alternatives from several large public cloud providers, the Royal Caribbean team landed on Mesosphere to tackle its unique infrastructure and operations challenges.

As one of the world's largest floating distributed systems, Royal Caribbean entrusted the Mesosphere platform to:

- **Keep ship-shore systems in sync** with real-time, accessible data across multiple origination points and periods of limited connectivity.
- **Orchestrate containers at scale** while making it easy to configure and deploy services from a single user interface and command line interface
- **Standardize its ship-shore systems footprint**, creating dead-simple edge clouds with the same operational experience, whether on ship or on shore

CUSTOMER STORY

Mesosphere was the clear choice to provide the scalable, reliable platform Royal Caribbean needed to modernize their infrastructure and enable digital transformation at scale. With Mesosphere as the backbone and service layer, any new application or service would be deployed quickly, easily, and efficiently across their fleet of ships.

Impact

Unlocking New Revenue Streams and Increasing Customer Satisfaction

By using Mesosphere, the cruise line was able to deploy a suite of applications on its ships to improve the on-board experience for passengers and unlock new revenue streams. As an example, the Royal Caribbean mobile app enhances the customer experience by making services and special offers discoverable and the transaction process easy.

Specifically, the app delivers timely, in-context offers to a new generation of passengers who expect to be able to check on-board activities, make restaurant and event reservations, and complete purchases from their mobile device. By creating a reliable, mobile experience—whether at the port or on the ship—Royal Caribbean stands to unlock new revenue streams. Royal Caribbean expects to make the app available on all vessels by the end of 2019.

With Mesosphere as its technology partner, Royal Caribbean is poised for continued innovation, using cognitive and machine learning to further improve guest services with even more personalized offers and cruise experiences.

By reducing the overhead associated with its legacy systems and replacing key components with elastically scalable, resilient architecture from Mesosphere, the global cruise line will be able to continue its investment in innovation.

Leveraging Real-Time Data in an Emergency

When operating technology systems on the open seas across the globe, being able to respond to inclement weather with confidence is key. As an example, Royal Caribbean's operations—along with great areas of the Southeastern U.S.—were affected by Hurricane Irma.

Despite the emergency, Royal Caribbean was able to create a seamless experience for guests. Because the service layer underneath the Royal Caribbean mobile application is built on Mesosphere, the engineering team was able to remotely update the cruising information for any affected voyages with complete confidence that the app would not be impacted.



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