

# OpenShift vs. DC/OS: Comparison Guide

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# WHY CONTAINER ORCHESTRATION

## Benefits of containers

- Allow software to run reliably when moved from one computing environment to another.
- Easily package an application's code, configurations, and dependencies into easy-to-use building blocks that deliver environmental consistency, operational efficiency, developer productivity, and version control.
- Ensure applications deploy quickly, reliably, and consistently regardless of deployment environment.
- Give you more granular control over resources, making your infrastructure more efficient.
- Enable businesses to optimize infrastructure resources, standardize environments, and reduce time to market.



## ROI of containers

- Server cost reduction: a clear CapEx advantage that is measurable through increased container density, compute efficiency, and server reduction.
- Reduced licensing costs: VMware licensing is expensive, but so are unused cloud nodes.
- Application deployment and cycle time improvements: this core DevOps benefit comes from deploying apps more reliably, quickly, and frequently.
- Greater flexibility. Move your containers to any host on any infrastructure from Amazon, Google, or Azure to the server under your desk.



## Challenges with containers

- Container sprawl is a real problem.
- Managing ten containers is one thing. But when dealing with hundreds, thousands, or millions, this gets complicated and time-consuming.

## Why container orchestration?

- Allows you to manage the life-cycle of a container.
- Standardize the environment and abstract away the specifics of the underlying operating system and hardware.
- Define not only the initial deployment of the containers, but also the management of the multi-container deployments as a single entity, including availability, scaling, and networking of the containers.



# RED HAT OPENSIFT

Red Hat OpenShift Container Platform is a secure, enterprise-grade platform that combines the industry-leading container orchestration engine with advanced application build and delivery automation features that can span infrastructures—private, public, and hybrid.

## Why OpenShift

- Built on top of Kubernetes and RHEL Atomic.
- Allows dynamic provisioning of storage for multiple storage types.
- Self-service enables developers to quickly and easily create applications on demand directly from the tools they are most comfortable with.
- Operators can leverage placement and policy to orchestrate environments that meet their best practices.
- Automates application builds, deployments, scaling, health management, and more leveraging integrated components from Kubernetes.

## OpenShift Online

Red Hat's hosted offering allows you to utilize the power of OpenShift without the headache of managing the infrastructure.

It adds some great features such as:

- *Access to a private database instance with full control. Choose between classic, relational, and modern NoSQL datastores including MySQL, PostgreSQL, MongoDB, and SQLite.*
- *Pre-created code repositories that allow you to instantly boot your favorite application framework.*
- *One Click Deploy to the OpenShift platform with its deep Git integration.*

## WHEN IS OPENSIFT A GOOD FIT?



- Organizations looking to consume enterprise Kubernetes in both on-premise and cloud environments.
- If you're already thinking in terms of multiple sets of stateless microservices, then OpenShift gives you a framework to establish the rules of interaction between them and then run the show.
- You're happy to invest in a slightly higher learning curve in exchange for increased flexibility.
- You need an established, but opinionated, method of doing business.
- You want the backing of Red Hat and the accelerated software release schedule it provides.

Barclays, a global financial services provider based in London, faced increasing regulatory pressure and market demands led by industry disruptors offering modern, digital services. Looking to increase innovation and productivity, Barclays set out to build an Application Platform-as-a-Service (aPaaS) as part of its cloud program. It used Red Hat® OpenShift Container Platform and other Red Hat solutions to update its IT infrastructure and adopt an agile, DevOps approach to application development, giving its developers on-demand, self-service capabilities. As a result, the bank improved its efficiency and agility to innovate faster and stay competitive.

## Challenge

- Facing industry and competitive pressure, Barclays needed to create a more responsive business.
- Barclays needed to deliver products to market quicker than ever and be more responsive to market trends.
- To become the bank of the future, Barclays sought to update both its IT environment and its culture, to take full advantage of the best tools and recruit the best banking talent.
- Barclays wanted to be more dynamic in the way it produced applications and make better use of underlying hardware and software, and staff.

## Solution

- Barclays adopted a DevOps approach where technical and business teams work together to quickly meet customer and market demands through continuous development.
- As part of the bank's cloud strategy, it chose to replace its traditional middleware for an on-premise aPaaS with Red Hat OpenShift Container Platform.
- This solution provides its development teams with a more secure, consistent, and scalable platform for application development and hosting.
- The bank received on-site assistance from Red Hat to design and build the solution and train its teams.

## Barclays Red Hat Solution Continued

- With its new DevOps approach and aPaaS environment, Barclays' developers can work more efficiently to quickly release updates and features.
- Self-service capabilities have cut provisioning times from weeks to hours and freed up IT staff to work on new, valuable projects instead of routine tasks. These improvements have helped the bank's internal users—in London and worldwide—work more effectively.
- Barclays is more agile with Red Hat OpenShift Container Platform. They can think of an idea, try it, fail, learn, and make adjustments quickly.
- Moving forward, the bank plans to move into public cloud computing and offer the same service across public and private clouds.





DC/OS, a datacenter operating system, is itself a distributed system, cluster manager, container platform, and operating system. Mesosphere DC/OS is the enterprise-grade product built for running data rich apps.

## What is DC/OS Mesosphere

- Apache Mesos pre-dates Docker and is described as a distributed systems kernel: in other words, it presents a single logical view of multiple computers.
- DC/OS is a cluster manager that makes computing resources available to frameworks.
- Provides support for container orchestration capabilities, including automatic workload recovery, security, networking, service discovery, storage, and more out of the box.
- Easily deploy distributed data services such as Spark, Kafka, Cassandra, and HDFS on a single platform.
- DC/OS runs on bare-metal, virtual (vSphere or OpenStack), and cloud (AWS, Azure).
- Offers single-click Kubernetes installation that is highly available, secure, and self-healing on any infrastructure.
- Mesosphere DC/OS automates the end-to-end management of Kubernetes, developer tools, and Big Data services so they can be delivered as-a-service on any infrastructure.
- DC/OS Universe includes application-specific intelligence that allows you to scale, update, and upgrade complex services such as Spark, Kafka, Cassandra.

## WHY DC/OS



- **DC/OS is a distributed operating system based on the Apache Mesos distributed systems kernel.**
- **Enables the management of multiple machines as if they were a single computer, and orchestrates resource management, schedules process placement, facilitates inter-process communication, and simplifies the installation and management of distributed services.**
- **Includes a web interface and available command-line interface (CLI) that facilitates remote management and monitoring of the cluster and its services.**



# DC/OS CASE STUDY: ROYAL CARIBBEAN CRUISE LINES



Royal Caribbean Cruise Lines is the world's second-largest cruise line operator. The cruise line wanted to build a digital hub that would define a smart middleware layer and provide agility, resiliency, scalability, and improved performance by leveraging microservice architecture and modern integration technology.

## Business challenges

- Orchestrating microservices across the land and sea is no small feat. Royal Caribbean is always solving for these unique challenges, including limited bandwidth, limited on-board IT support, limited compute power from on-board datacenter, and zero downtime for upgrades.
- Facing significant infrastructure and operational challenges presented by both the distributed nature of a fleet of ships as well as an earlier reliance on numerous legacy systems, Royal Caribbean needed a modern technology platform that could create a unified footprint from ship to shore.
- The team needed to extract data from the legacy system to enable modern, mobile experiences for passengers.
- Royal Caribbean also wanted to unlock new revenue streams by delivering 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. To do this, they needed a reliable, mobile experience both at the port and on the ship.

## Solution

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

*Standardize their ship-shore systems footprint, creating dead-simple edge clouds with the same operational experience, whether on ship or on shore; and*

*Keep ship-shore systems in sync with real-time, accessible data across multiple origination points and periods of limited connectivity.*

Mesosphere DC/OS was the performing, reliable platform they needed to orchestrate container and data services at scale. Any new application or any service would now be deployed with microservices principles.

## Results

- The new Royal Caribbean mobile app was built on top of a Mesosphere DC/OS service layer. This mobile app enhanced the customer experience, making services and special offers discoverable and easing the transaction process.
- The cruise line now has many new revenue streams and a better customer experience.
- Reduced the overhead associated with its legacy systems and replaced key components with elastically scalable, resilient architecture from Mesosphere DC/OS. Now, the global cruise line will be able continue its investment in innovation.

### OPENSIFT VS MESOSPHERE DC/OS

	OpenShift	Mesosphere DC/OS
Release Date	2014	2009
Best for	<p>Hosting off-the-shelf applications and frameworks supported by the underlying Kubernetes framework.</p> <p>Those seeking an opinionated, but robust, workflow.</p>	<p>Hosting Big Data (Spark) frameworks that were purpose-built for Mesos.</p> <p>Users who want to skip private cloud.</p> <p>Mainframe-like workloads.</p>
Strengths	<p>10 years of Google research and development in containers and orchestration.</p> <p>By far the largest community actively contributing.</p> <p>Red Hat adds several enhancements that are not in the main code base.</p>	<p>COTS and other solutions tend to work here before working on Kubernetes.</p> <p>Used by large organizations at massive scale (e.g., Samsung, Twitter).</p> <p>Interest from large financial institutions and public cloud providers.</p> <p>Spark, a Mesos framework, is seeing traction in the Big Data market.</p>
Weaknesses	<p>No Windows Server support (active area of development with early 2017 expected release).</p> <p>Lack of reliable documentation.</p> <p>Kubernetes is relatively complex. Customers going the DIY route may need to seek professional services or Kubernetes distributions.</p>	<p>The complexity of maintaining Mesos and all its frameworks on a single product means Mesosphere is committing to a lot and may spread too thin.</p> <p>Requires a large investment in technical resources.</p>

Since 2008, Shadow-Soft has been evangelizing and deploying open source software and open standards to help customers “take the power back” from their technology vendors. Shadow-Soft provides consulting and managed services across three specialties: DevOps, Application Infrastructure, and Cloud.

Contact a consultant and let us be your open source guide.

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