Unlock business value with IBM and Red Hat OpenShift

Transform your cloud approach with the flexibility of an open hybrid cloud architecture

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Executive summary

Cloud is revolutionizing how businesses create value. Cloud adoption is no longer a question of if but of how fast and to what extent. Hybrid cloud models have emerged as a way to enable maximum value from combining multiple cloud infrastructures. Open hybrid cloud architecture builds on that value by adding power from the vast community of open-source developers, enabling unparalleled innovation at pace and scale. The open hybrid cloud architecture, based on IBM Cloud® Paks and the Red Hat® OpenShift® Platform, drives substantial value as a highly portable cloud with built-in security and enterprise-grade support.

But Red Hat OpenShift is more than just the engine that runs our capabilities. It's a technology that makes it possible for our clients to run workloads in essentially any environment—physical, virtual, edge computing, and public and private clouds. It's a technology that provides value wherever you are on your container journey. For example, if you can't move out of your data center due to regulatory requirements, Red Hat OpenShift can help you get the process moving while reducing your server estate and operating system license costs. How you realize value will depend on where you are now. This white paper showcases four common cloud strategies and how the introduction of Red Hat OpenShift can help organizations get more than twice the value of traditional approaches to cloud:[1]

1. Self-managed open source
Your organization is taking an open-source approach to Kubernetes and building the platform in-house.

2. Hybrid cloud migration
Your organization is gradually migrating to a single public cloud vendor.

3. Two public clouds
Your organization's IT estate has moved to a combination of two public cloud vendors and you want to modernize your applications to take better advantage of the cloud.

4. Cloud managed services
Your organization is building a new cloud-native environment on a single-vendor public cloud.

A modern approach

From both a business and a technical perspective, modernized solutions that use Red Hat OpenShift provide tangible value when compared to solutions based on existing applications running on virtual machines (VMs). These benefits can be achieved in essentially any environment—physical, virtual, edge computing, and public and private clouds, and include:

- Security costs reduced by up to 66% and unplanned downtime by at least 30%[2]
- Resource consumption and licensing costs reduced by up to 50% and IT administration costs by up to 60%[2]
- Development accelerated by 2–3 times in most cases, saving between 12–24 weeks of labor costs per new application[2]

Red Hat OpenShift also provides unique advantages when compared to regular Kubernetes or xKS offerings:

- Improved agility due to the levels of automation and developer productivity enhancements provided by Red Hat OpenShift
- End-to-end enterprise support, including upgrades, patching, help desk support and resolution service-level agreements (SLAs)
- Consistency across hosting platforms, including those on premises
- Enterprise-grade security
- Lower cost to build, integrate and operate
- Lower headcount recruitment costs, as smaller administration teams are required for Red Hat OpenShift

xKS is the generic term for a cloud-native Kubernetes service managed by a provider. Current xKS services include:

- IBM Cloud Kubernetes Service
- Amazon Elastic Kubernetes Service
- Microsoft Azure Kubernetes Service
- Google Kubernetes Engine

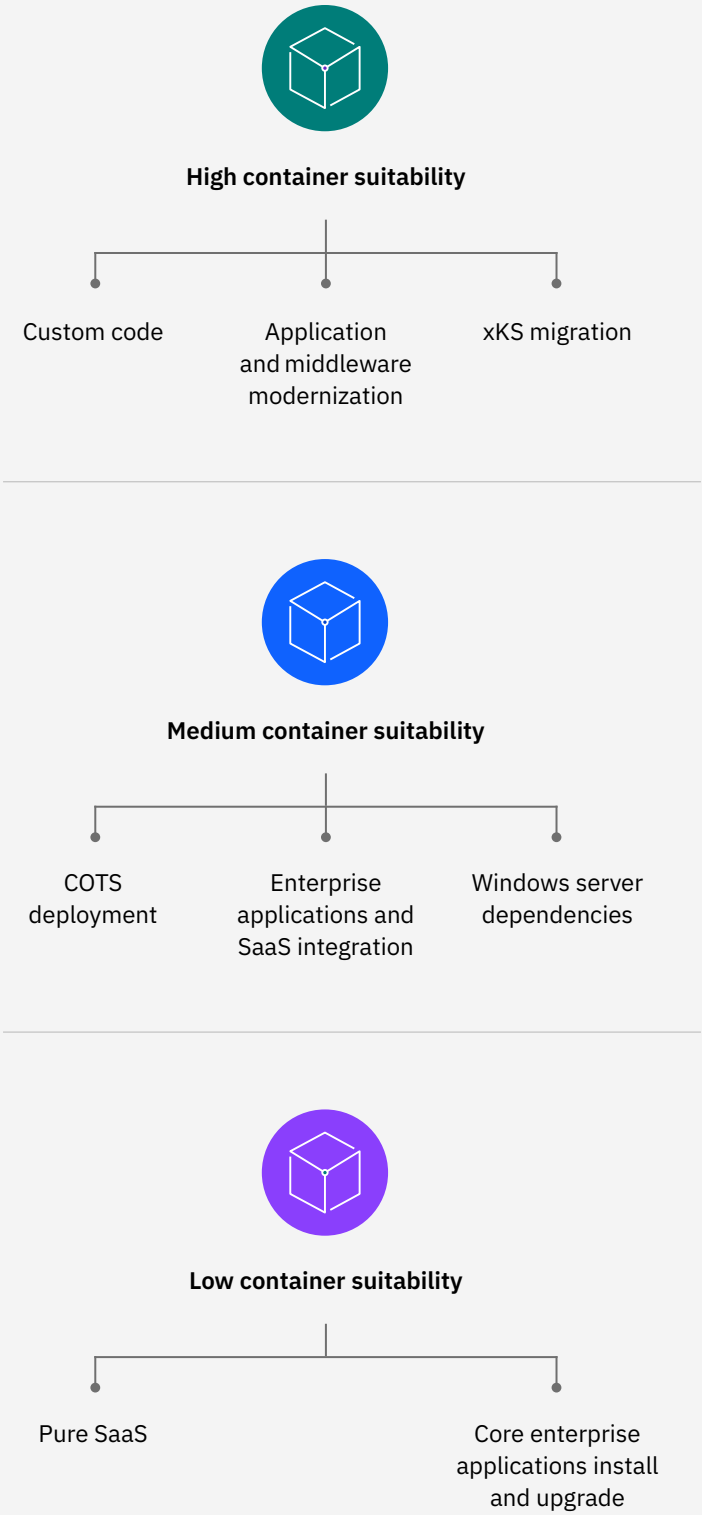
Like most commercial software, Red Hat OpenShift requires investment in software licenses and in delivery, support and management skills. Some skill requirements can be reduced if using an instance managed by a cloud vendor. Containers are an excellent solution for getting software to run reliably while moving from one computing environment to another, providing organizations with more flexibility in where they can run their applications.

Though containers are suitable and practical for most application development and application modernization situations, they're not possible in every situation. A solution's suitability for containerization tends to fall into one of three categories.

1. High container suitability
Containers are most suited to custom code deployments, modernized code or code migrated from other xKS deployments.

2. Medium container suitability
When it comes to vendor packages, many commercial off-the-shelf (COTS) and middleware vendors are starting to embrace containers to simplify deployment and management processes. Enterprise resource planning (ERP) and software-as-a-service (SaaS) applications don't currently support containers for the core package and will likely require complex integration solutions to connect them to the enterprise systems. Solutions, packages or code with Microsoft Windows server dependencies are currently only supported through managed instances of Red Hat OpenShift on Microsoft Azure and Amazon Web Services (AWS), though support for other options is expected to roll out in 2021.

3. Low container suitability
There are two main areas where Red Hat OpenShift isn't currently a major solution option: ERP core install upgrades where the ERP platform doesn't support containers, and pure SaaS deployments with simple or no integrations.



Now that we touched on the suitability of using container technology, let's take a look at four common scenarios where Red Hat OpenShift can add exponential value.

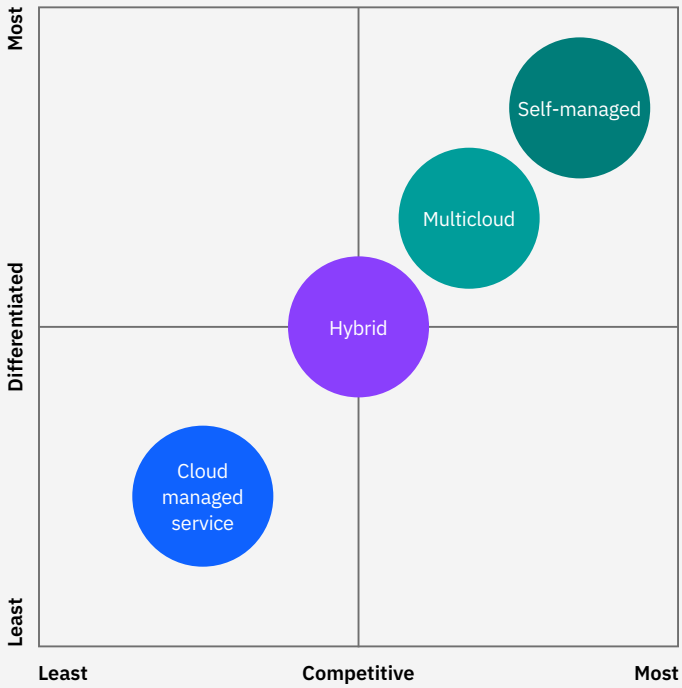
Self-managed open source
Your organization is taking an open-source approach to Kubernetes and build the platform in-house. Red Hat OpenShift helps minimize the costs associated with building, integrating, testing and maintaining the platforms.

Two public clouds
Your organization has moved the estate to a combination of two public cloud vendors and wants to modernize the applications to take better advantage of the cloud. Red Hat OpenShift provides a consistent platform across the two clouds, helping to reduce operating labor costs, increase flexibility and minimize the need for specific, in-house cloud skills.

Hybrid cloud migration
Your organization is gradually migrating to a single public cloud vendor. Red Hat OpenShift helps bridge the gap between container and cloud for a lower-risk approach to migrating straight to public cloud.

Cloud managed services
Your organization is building a new cloud-native environment on a single-vendor public cloud. Red Hat OpenShift helps minimize inflexible linking between applications and the underlying cloud platform, and provides application hosting, security and automation regardless of the cloud provider.

Red Hat OpenShift provides transformative value across cloud use cases



Self-managed open source

In this scenario, your organization has opted for a self-managed approach to Kubernetes and is building the platform in-house on an open-source Kubernetes distribution. Typically, this is because of a perception that open source is cheaper and more flexible than alternatives. Additionally, the organization might be using open-source to retain control over the software platform. You may already be a few months or even years into the platform build and have some early adopters on the platform. While this scenario isn't as common for cloud-based deployments as it was a few years ago, it still applies to on-premises infrastructure and organizations that don't want to use public cloud Kubernetes offerings.

Typical problems that arise from the self-managed route include:

- Loss of key staff, making platform support unviable
- High cost to maintain due to the frequency of change and testing complexity
- Difficulty adding business applications to the platform

Though Red Hat OpenShift has Kubernetes at its core, it's much more than Kubernetes alone. Organizations that take the self-managed route have to integrate many different packages, mostly providing the nonfunctional wrapper around core functionality—like container registry, systems monitoring, performance dashboards, deployment automation and security hardening—to create a deployment that works for the enterprise.

The initial draw of the self-managed approach makes sense—it's free software. But though the software is free, the additional labor costs required to build, integrate, test and maintain the platforms aren't. Maintaining the platform can also present a challenge, especially if the management is handed over to a separate team that may not be prepared for the complexity.

While a Red Hat OpenShift license is not free, the costs can be partially or wholly offset by labor savings in the platform build and support teams. In fact, using Red Hat OpenShift can help significantly reduce IT infrastructure support team size compared to the open-source equivalent.

Red Hat OpenShift is flexible—the default installation provides a pre-integrated platform ready for the enterprise. However, each of the elements, such as the container repository, monitoring solution and DevOps pipelines, can be replaced with your organization's preferences.

Self-managed integration is also conducted without any formal support, requiring more highly skilled engineers to get things working and remain working throughout production. With Red Hat OpenShift, most of this internal integration, patching and ongoing testing can be delegated to Red Hat. A long-term support commitment from Red Hat also helps mitigate risks with the enterprise features—for example, security and the testing that Red Hat routinely applies to new releases.

	Red Hat OpenShift	Self-managed
Security and integration tested	✓	✕
Roadmap and release lifecycle	✓	✕
Patches and fixes	✓	✕
Enterprise-level support	✓	✕
Consistent deployment to simplify maintenance	✓	✕

Hybrid cloud migration

In this scenario, your organization's environment is split between on premises and public cloud and you may be facing challenges during the transition. Common challenges include trouble obtaining end-to-end service management that is joined up across the platforms and difficulty migrating applications to the public cloud platform due to the costs of refactoring applications to work on the chosen cloud.

Red Hat OpenShift can help bridge the gap, providing a single platform that supports containerized and noncontainerized applications for a lower-risk approach to migrating straight to a public cloud. Containerizing locally onto Red Hat OpenShift effectively turns the on-premises platform into a private cloud.

There is a complex mix of technologies at play in this scenario, with both advantages and disadvantages to remaining on VMs or moving directly to Red Hat OpenShift on a public cloud without using VMs for virtualization.

Virtual machines
Containers generally have a smaller footprint than VMs. The reduced size enables Kubernetes to more efficiently place workloads onto virtual servers, reducing the number of servers, operating system licenses and other associated software needed to run the workload. Red Hat OpenShift can also host Windows and Linux® VMs natively, which can reduce software license costs and enable a single operating platform for VMs and containers.

Public cloud
Migrating workloads running on premises on Red Hat OpenShift can result in a rapid, low-risk migration. End-to-end service management across on premises and public cloud is achievable at a lower cost due to the platform consistency.

Windows container support is still emerging and limited to the most recent version of Windows Server. To minimize the impacts of Windows upgrades, Windows applications may need to move to a VM in the short term. Fortunately, Red Hat OpenShift virtualization supports VMs and provides a consistent platform for both VMs and containers.

Two public clouds

In this scenario, your organization has moved the estate to a combination of two public cloud vendors and wants to modernize the applications to reap the full benefits of cloud. Maybe you had an expiring data center contract that drove a firm date for services to move or wanted to lower costs by closing data centers altogether. These external constraints may have led the organization to implement a lift-and-shift approach to cloud rather than perform cloud transformation or modernization.

Simply lifting and shifting applications to cloud is unlikely to provide much benefit, and also runs the risk of increasing costs. On the other hand, a complete transformation to cloud managed services isn't realistic, given the level of investment and change risk required.

Many organizations in this situation explore containerization as an initial step to enable applications to take advantage of some of the cloud benefits without requiring expensive application rewriting. Red Hat OpenShift provides a consistent platform across two public clouds, helping to reduce operating labor costs, increase flexibility for moving applications between clouds and minimize specific cloud skills needed in-house.

Advantages of containerizing with Red Hat OpenShift include:

- Consistent application hosting platform to simplify the process of moving and sharing applications and code across teams
- A single governance control plane that is consistent across all deployments, simplifying operations management and helping reduce operating costs
- Consistent operations and service management information from the Red Hat OpenShift and applications layers, helping to reduce support costs
- Simple deployment pipelines with Red Hat OpenShift deployment consistent across clouds
- Reduced technology silos and efficient development lifecycle, with development teams deploying to Red Hat OpenShift regardless of cloud

For new application builds, cloud managed services makes a lot of sense if your organization is comfortable with closely coupling applications with the platform. But with existing or traditional applications, the cost to rebuild applications as cloud managed services is high and can make it hard to use and integrate with COTS packages.

Building solutions using cloud managed services provided by cloud vendors is attractive but can cause problems in the long term. Different skill sets are required across the various cloud platforms. Applications may end up being tightly coupled with the platform they were initially built on, which limits portability. Test efforts are often duplicated due to differences between platforms. Significant effort is required to obtain and maintain compliance of multiple platforms composed of different—and often inconsistent—implementations of cloud services.

To retain some independence from specific cloud vendor services, Red Hat OpenShift precludes the use of the cloud managed services offered by the cloud vendors. As industry regulators grow more concerned with the concentration risk of many organizations relying on just a few suppliers for their IT hosting, the flexibility to change cloud platform without significant changes to the application estate is a major benefit.

Cloud managed services

In this scenario, your organization is building a new cloud-native environment on a single-vendor public cloud. Many organizations see a single cloud platform as a low-risk, low-cost option, expecting the cloud vendor's ecosystem to meet all the organization's needs. The downside is that this approach tightly links applications to the hosting platform and makes it harder to integrate outside of the cloud platform's ecosystem. And when cloud outages occur, it can have damaging business impacts for organizations solely dependent on a single provider.

A cloud-native instance of Red Hat OpenShift can help minimize the tight coupling of applications to the cloud platform. Delivered as a cloud-managed service, this version of Red Hat OpenShift provides application hosting, security and automation regardless of cloud provider. As an added benefit, the instance is fully managed by a joint team of the cloud vendor's support team and Red Hat experts to avoid cloud-specific proprietary implementations impacting the developer experience.

The evolution of container adoption

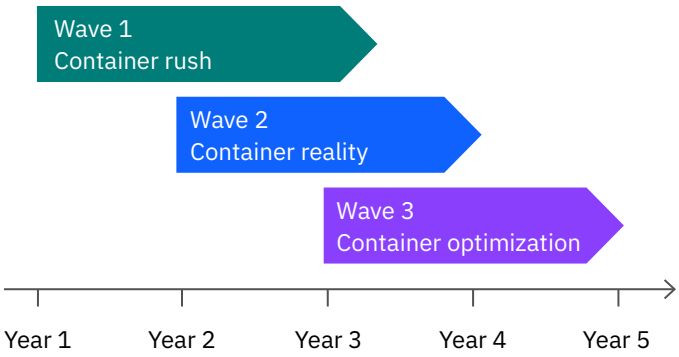
The container adoption marketplace can be summarized into three waves:

1. Container rush
Organizations want to quickly implement containers as they did with previous technology shifts, such as cloud. In this wave, organizations are looking for the fastest, simplest option.

2. Container reality
Organizations start to discover the realities that come with containers, such as the challenges of running containers at scale. In this wave, organizations are looking for ways to get value from their platform investments and improve overall adoption.

3. Container optimization
Organizations look for ways to improve costs and productivity with containers. In this wave, organizations are looking at productivity improvements and total cost of ownership (TCO) benefits.

The majority of large enterprises are still in the first wave of container adoption. As environments get more complex and organizations' learnings and experience help them uncover their specific containerization needs, the benefits of Red Hat OpenShift become even clearer.



Why IBM?

IBM can help your organization navigate container decision-making in both the long term and the short term. As Red Hat's largest Premier Business Partner with more than 750 Red Hat certifications and growing, IBM's commitment is to help organizations manage risks, optimize outcomes and improve speed with Red Hat OpenShift.

IBM can help your organization to:

- Move and modernize workloads and applications.
- Build innovative applications and experiences.
- Advise on every step of the journey to cloud.
- Manage, govern, and optimize hybrid multicloud environments.

To learn more about how IBM can help you unlock transformative power across your organization with Red Hat OpenShift, visit ibm.com/services/cloud/modernize-applications

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2. The Total Economic Impact™ Of IBM Services and Red Hat, Forrester, November 2020.

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