# The future of cloud-native app delivery is here: What you should know

According to IDC, the ability to consistently manage multiple, distributed container and Kubernetes clusters across diverse on-premise and public cloud platforms is crucial to digital business success.[1]

## Introduction

The way organizations approach building, deploying, and implementing software applications is evolving. In fact, 86% of survey respondents believe that a cloud-native development strategy is extremely or very important to their company's success.[2]

To thrive in fast-paced, software-powered markets, organizations are adopting (or expanding) cloud-native development approaches to build, run, and increase speed, while maintaining consistency and security. To deliver the solutions customers want at the pace business needs, organizations must navigate a robust cloud-native ecosystem to find the right software and tools for their teams. But with nearly every cloud provider offering its own unique marketplace, knowing where to find the partners and solutions you need now and in the future can be challenging–but it is a critical part of the equation.

This whitepaper looks at the key features of cloud-native application delivery, the importance of access to certified software for container-based environments, and what to look for when choosing an open cloud marketplace.

## What is a cloud-native approach?

**Responding to change with speed, resiliency, and agility.**

Cloud-native development provides the ability to develop, deploy, and operate applications in a consistent way on any cloud, using the same set of tools and operational best practices.

Ideally, a cloud-native application is a collection of small, independent, and loosely coupled microservices, deployed in Linux® containers, and connected through application programming interfaces (APIs) or a mesh network for message routing.

With microservices, applications are broken down into their smallest components, independent from each other but working together to accomplish the same tasks. This approach to software development values granularity, being lightweight, and the ability to share similar processes across multiple applications. It is developed by small teams using DevOps workflows like continuous integration and continuous delivery (CI/CD). This approach allows services to be built quickly, deployed automatically, and updated regularly—it is a big step forward from waterfall development cycles.

This whitepaper reviews the benefits, features, and challenges of cloud-native application development—and what IT leaders should know when adopting this approach.

1 *IDC Technology Spotlight, sponsored by Red Hat. "Digital Business Success Depends on Effective Multicluster Kubernetes Management." #US47479221, Feb. 2021.*

2 *Red Hat. "Red Hat cloud-native development outlook," August 2020.*

"With Red Hat OpenShift, DevOps and development teams increased the number of new applications and features that they delivered to their businesses by 44% and 196%, respectively."[3]

**IDC**
The Business Value of Red Hat Openshift

## Benefits of cloud-native development

### Speed

Organizations need to become more agile to react quickly to changing customer needs and potential market threats. To bring applications to life faster, many IT leaders are investing in DevOps-led innovation and microservices to accelerate agile software development and take advantage of automated CI/CD workflows.

### Scalability

Organizations adopt cloud computing to increase the scalability and availability of applications when and where they are needed. Self-service and on-demand provisioning of resources enables this, as well as automating the application life cycle from development to production. Cloud-native development and Kubernetes Operators provide a faster way to update apps, while improving quality and reducing risk.

### Modernization

Whether an organization is hosting an entire application in the cloud or migrating parts of legacy IT, adding new tools is only one part of modernization and moving to a cloud-native approach. When adopting a comprehensive cloud-native development strategy, IT leaders are considering how modernization impacts their people, processes, and tools.

## Key cloud-native features

Cloud-native applications offer additional and advanced functionality for consistent output and quick adaptability to a fast-evolving environment. These advanced capabilities of cloud-native development are made possible by the following features:

### Containers

A key foundation of cloud-native applications, containers deliver the entire software package in an executable manner, allowing developers to easily segregate applications from their environment—ensuring portability. As a result, developers can run the same container, consistently, on either the development, test, or production stage to dramatically speed delivery times. With the right container platform and certified software, enterprises can automate operations to manage hybrid cloud, multicloud, and edge deployments.

### Orchestration

When production applications span multiple containers, those containers must be deployed across multiple server hosts. This is where a container orchestration platform can be powerful and viable for any organization. Automation can eliminate many of the manual processes involved in deploying, managing, scaling, and networking containerized applications. Developers can make new containerized applications, host them, and deploy them in the cloud with scalability, control, and orchestration.

**3** *IDC Whitepaper, sponsored by Red Hat. "The Business Value of Red Hat OpenShift." #US47539121, Mar. 2021.*

**Microservices**
Microservices are an architectural approach to building applications. What sets a microservice architecture apart from more traditional, monolithic approaches is how it breaks an application down into its core functions. Each function is called a service, and they can be built and deployed independently, meaning individual services can function (and fail) without negatively affecting the others. This approach allows development teams to rapidly build new components of applications to meet changing business needs.

IDC research shows 97% of enterprises worldwide expect to take advantage of connected hybrid and multicloud infrastructure spanning both on-premise resources and one or more public cloud platforms to support cloud-native applications.[4]

## Three challenges to overcome to take full advantage of cloud-native development

For most development teams, it is rare to write a totally new application that is not connected to another aspect of their business. According to IDC, organizations, on average, have 127 applications in their portfolio and intend to grow their application portfolio nearly 40% over the next five years.[5]

As developers increase application innovation to respond to customer needs and changing markets, they can encounter new challenges and roadblocks that hinder progress. For organizations to get the most value from cloud-native development, they will need to address challenges in the following areas:

**Managing a growing, hybrid mix of applications and infrastructure**
As an organization adds new applications to its portfolio, increased complexity and management needs are inevitable. To plan and provision for these new demands, it is important to consider:

- New applications that need to be integrated with older systems, which will increase application management.
- Multiple hosting environments including private, public, and hybrid cloud, as well as on-premise environments, which may create security, interoperability, and traceability challenges.
- Rising costs, which can follow the growing need for application and infrastructure management.

**Selecting the right software and tools from the multitudes available**
Custom software applications are a major part of developing solutions and being competitive. The need to develop quickly without sacrificing quality or increasing risk to the organization is paramount. While nearly every cloud provider has a marketplace that offers a collection of open source software, developers can lose time searching for the right software and tools. Counteract these delays by considering the following:

- Not all software and tools will work across clouds or environments, which can result in being locked into one provider.
- Software for enterprise solutions need to be updatable, secure, and certified to work in their intended environment.
- In addition to software requirements, enterprise architects should also consider what support is available to their organization when needed.

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**4** *IDC Technology Spotlight, sponsored by Red Hat. "Digital Business Success Depends on Effective Multicluster Kubernetes Management." #US47479221, Feb. 2021.*

**5** *IDC White Paper, sponsored by IBM. "Build Cloud-Native Applications in a Hybrid Multicloud World." #US45979220, March 2021.*

**Embracing cultural and organizational change**

One of the most significant challenges that organizations face when evolving their development methodologies is the impact on organizational culture and leadership. When approaching the people portion of modernization, IT leaders should consider:

- Engrained processes resulting from traditional approaches to IT management can be a major hurdle toward adopting methodologies such as DevOps.
- While traditional IT cultures may center their values on risk aversion and prevention, the trepidation toward evolving application delivery methodologies and adopting new technologies can counteract organizations' ability to innovate and evolve.
- A new governance and management model will be necessary to streamline approval processes, which can benefit from certified software.

## Respond to change with Red Hat Marketplace

Red Hat® Marketplace helps organizations get the most value from Red Hat OpenShift®, a leading Kubernetes platform designed for developing and running critical business applications. Red Hat Marketplace is a site to discover, try, purchase, deploy, and manage certified container-based software across environments, including public and private cloud, and on-premise.

Developers can deploy faster with access to certified software that integrates with any cloud, without locking into one provider. With automated deployment, software is instantly available to deploy on any Red Hat OpenShift cluster.

Red Hat Marketplace includes responsive support, streamlined billing and contracting, simplified governance, and a single dashboard across clouds for both open source and proprietary software.

## Alignment with cloud-native development needs

### Speed

Organizations across industries are under pressure to deliver services more quickly and securely than ever before.[6] Red Hat Marketplace makes it easy to discover and access certified software to help developers deliver applications faster without compromising quality. This is achieved through:

- Access to certified software from an extensive list of vetted and approved service providers so developers have the tools they need when they need them.
- Certified software that allows for seamless integration, shorter approval processes, and faster deployment.
- Automated deployment, so software is instantly available on any Red Hat OpenShift cluster.
- Certified software includes upgrades, life-cycle management, log processing, and auto-scaling, eliminating time spent on management and maintenance.

### Scalability

Enterprise architects need to think about applications and infrastructure differently. Containers allow IT leaders to view applications less as individual, unique solutions and more as broad, portable services that can be turned on and off to match business needs. Software that uses Kubernetes Operators benefit from:

- Built-in management logic to make automated deployment possible, providing the scalability, security, and orchestration advantages of Kubernetes.
- Unifying development and operations. Improving deployment frequency and delivering higher quality releases, resulting in faster time to market, less risk, and high application quality as they scale.
- Establishing a CI/CD pipeline resulting from DevOps.

### Modernization

The successful adoption of cloud-native development relies as much on people and processes as it does on software and tools. Red Hat Marketplace via Red Hat OpenShift helps close the skills gap and streamlines processes to simplify container management. As a result, organizations can get the most value from container-based cloud-native systems, including:

- A consistent support experience backed by stringent service-level agreements (SLA) with all Red Hat partners.
- Visibility and control of license usage and spending across all environments on a single dashboard, facilitated by metering.
- Instrumentation and monitoring to help IT leaders understand performance and ensure a quality end-user experience.
- The ability for customers to build once and deploy to any environment with software that allows workload portability across clouds, ensuring future flexibility.

6 *Bowker, Mark. "Streamlining DevOps in Hybrid, Multi-cloud, On-premises, and Edge Environments." ESG, Oct. 2020.*

## Conclusion

IT organizations must deliver innovative customer experiences to stay competitive, but with every new application and service release there is potential to add cost and complexity.

Cloud-native application development is an approach to meeting the rising demand for innovation solutions, and Red Hat Marketplace can help. Through access to certified container-based software across environments—including public and private cloud and on-premise—plus automated deployment, simplified governance, and a single dashboard across clouds for both open source and proprietary software, organizations can respond to change with speed, resiliency, and agility.

Learn more at marketplace.redhat.com.

### About Red Hat

Red Hat is the world's leading provider of enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers develop cloud-native applications, integrate existing and new IT applications, and automate and manage complex environments. A trusted adviser to the Fortune 500, Red Hat provides award-winning support, training, and consulting services that bring the benefits of open innovation to any industry. Red Hat is a connective hub in a global network of enterprises, partners, and communities, helping organizations grow, transform, and prepare for the digital future.

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