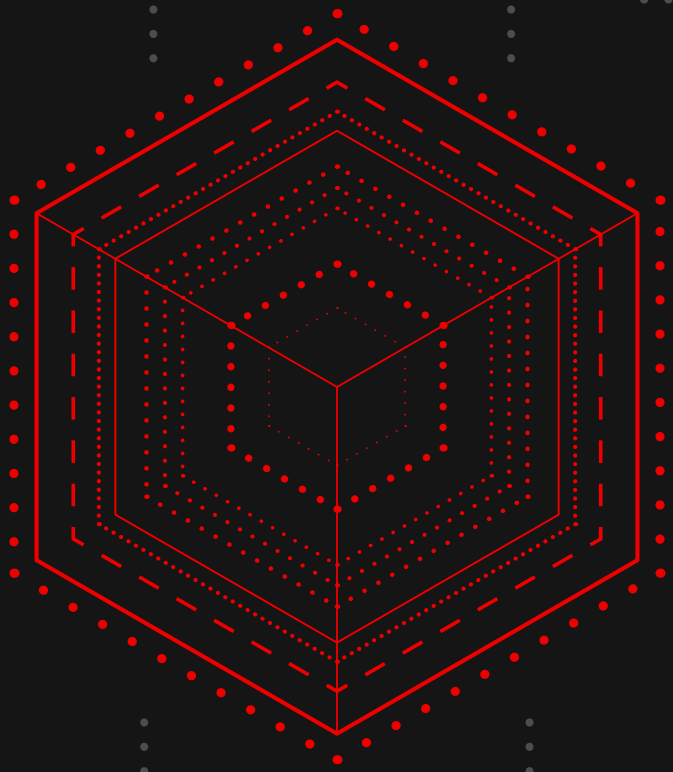
Red Hat



Gain a competitive edge with your

CONTAINER STRATEGY

How to choose a simple, efficient, and more secure Kubernetes platform

Introduction

The future of business innovation is built with Kubernetes in the cloud. It offers limitless possibilities for transforming how we live and work–from today's streaming mobile services to tomorrow's drone deliveries and driverless transport.

And while cloud adoption is now status quo in the marketplace (with Kubernetes headed the same way as organizations embrace modern container-based apps), a successful cloud strategy that supports the next wave of intelligent technologies adds a new layer of considerations.

76%

of survey respondents have or are planning to adopt Kubernetes.[1]

Part of the digital transformation journey for companies has been about embracing the right cloud platform(s), infrastructure, and applications to meet new customer demands. With cloud technology maturing into mainstream adoption, having the right cloud infrastructure to serve as a reliable foundation for flexible innovation is what is leading corporate growth strategies.

Digital business transformation is accelerating even faster as organizations scramble to adopt resilient business models. Any retailer without a curbside purchasing app understands: those who hesitate will fall behind. The ability to adapt quickly when the market changes is paramount to survival.

While cloud adoption is now status quo in the marketplace, a successful cloud strategy that supports the next wave of intelligent technologies adds a new layer of considerations.

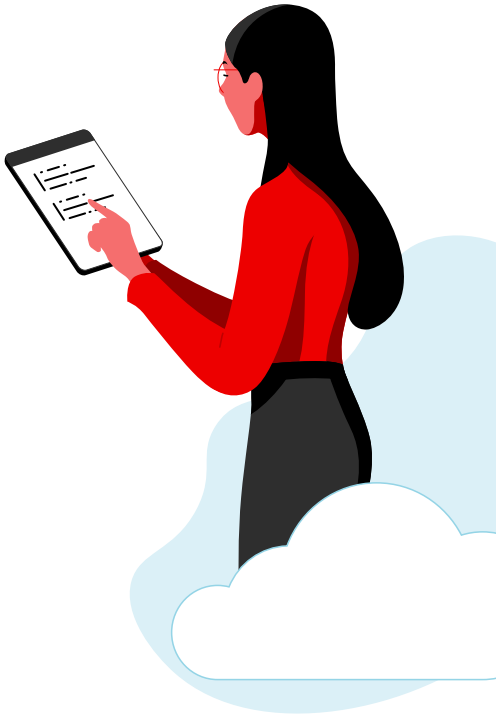
[1] 2021 Cloud-native development survey. Conducted by Red Hat via Qualtrics, December 23 - January 9, 2021.

The challenges of delivering cloud-based applications are multifaceted, and they affect everyone in the enterprise.

The modern business environment is about building new applications and refactoring traditional apps to take advantage of cloud-native functionality—and doing it in a continuous stream to meet demand. It's an agile, app-first approach in a hybrid world that depends on strategic use of containers, Kubernetes, and cloud technologies.

Yet it's a complex matter to prepare your business for the future so you can meet trends head-on. The challenges of delivering cloud-based applications are multifaceted, and they affect everyone in the enterprise.

As modern app development creates new demands for modern hybrid cloud orchestration and management capabilities, organizations are faced with teaching their teams new skills, like managing a new technology, refactoring legacy applications, and building new cloud-native apps.



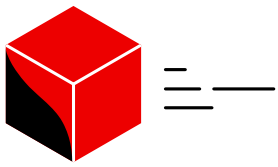
This e-book will help you choose the right Kubernetes platform to build, manage, and maintain container-based applications at scale. It looks at the foundation of Linux® applications, the value of a hybrid multicloud strategy, and a proven open source approach from Red Hat that delivers speed and flexibility in a more secure environment.

Chapter 01

The foundation of Kubernetes

A brief history of open source contributions and why containers start with Linux

Today there is a broad group of companies and individuals contributing ideas and collaborating on the Kubernetes upstream project to make it even better.



Red Hat has a long history with Linux and container technology. As an early contributor to the Docker[2] open source project, we have helped develop industry standards for the container runtime and packaging format.

Kubernetes, originally developed by Google engineers, is an open source container orchestration platform for managing applications across multiple hosts. It automates many of the manual processes involved in deploying, managing, and scaling containerized apps.

Red Hat and Google began collaborating on the Kubernetes project in 2014,[3] when the need for a tool to orchestrate multiple containers across multiple hosts led them to standardize on Kubernetes.

Did you know?

Red Hat is the number two contributor to Kubernetes,[5] and one of the first companies[6] to bring Kubernetes to market with Red Hat OpenShift.

Experienced in building out its own orchestration solution, Red Hat recognized the benefits of the Kubernetes technology. With Red Hat's alignment with Linux, Kubernetes was an easy choice.

In 2015, Google donated the Kubernetes project to the Cloud Native Computing Foundation (CNCF).[4] Since then, the Kubernetes open source community has continued to innovate and improve the technology.

[2] Red Hat press release, "Red Hat and dotCloud collaborate on Docker to bring next generation Linux container enhancements to OpenShift platform-as-a-service." September 19, 2013.

[3] Red Hat blog, "Red Hat and Google collaborate on Kubernetes to manage Docker containers at scale." July 10, 2014.

[4] Finley, Klint. "Open source is going even more open – because it has to." Wired Magazine, 2015.

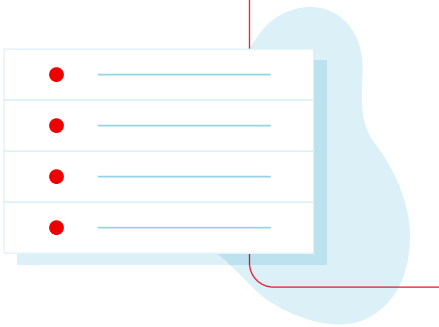
[5] Cloud Native Computing Foundation. "Kubernetes companies statistics." Accessed May 6, 2021.

[6] Red Hat press release. "Red Hat Delivers OpenShift Enterprise 3 to power a new web-scale distributed application platform." June 24, 2015.

Red Hat has added significant value to the community by bringing perspectives from thousands of customers–plus all the ideas related to their use cases. Many of these additions have become extensions to Kubernetes and features added to Red Hat® OpenShift® to answer the growing challenges and needs of the modern customer.

Kubernetes is a critical technology, not a buzzword

When you evaluate Kubernetes-based app platform solutions, it becomes clear that vendors like to build their offering around a promise: *Run multiple apps on many clouds.*



It becomes clear that vendors like to build their offering around a promise: *Run multiple apps on many clouds.*

Part of the process of choosing the right partner is to distinguish between marketing terms and architecture functionality. Solutions that may look the same on the surface are often so different at the foundational level that one vendor's box of car parts is another's ready-to-drive SUV.

Vendors that haven't yet adopted Kubernetes may have continued to innovate under the old business paradigm of infrastructure security and stability. But today's market also demands development speed and agility, which leaves them scrambling to catch up.

A collection of disparate components offered under a catchy umbrella marketing term simply won't give you the performance of a market-tested solution with thousands of successful use cases.

Did you know?

If you want to use Kubernetes today, you need a platform that is ready today. You need speed, stability, security, and scale. And you need it to run on multiple clouds.

How do you choose the right Kubernetes platform?

As more organizations embrace digital transformation, cloud adoption and the related growth of containers is pushing Kubernetes out of its developer-centric niche into the mainstream.

Companies are seeing new ways to use containers—in datacenters, for multicloud portability, and at the network edge. They're realizing broader business benefits as they explore the versatility of containers to run applications.

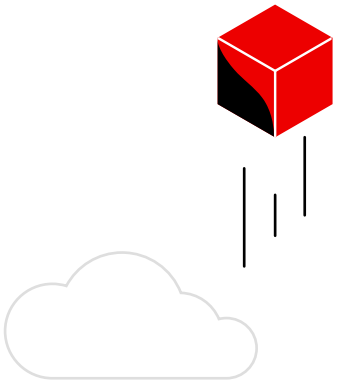
The market is catching up to what's technically possible. And while companies need Kubernetes to deliver cloud-based innovative customer experiences, each new application and service they release adds cost and complexity to their IT process.

Meanwhile, the business problems you're trying to solve are immediate. Your technology choices need to be viable right now, which means you need to align your goals to the right container strategy.

If the cloud is part of your story, it's important to choose something that gives you flexibility with the cloud. Being flexible enables you to adapt for the future—the wrong Kubernetes platform will bind you to the past.

The best Kubernetes platform to prepare your business for the future comes ready to build and manage your solutions. You don't have to create a system from scratch because what you need is already native to Kubernetes.

A hybrid world demands a multicloud approach



Most organizations need to innovate on a budget. This can mean developing new applications in a public cloud and moving existing workloads and legacy apps there too. But the reality is never as simple as a full-scale cloud migration.

Instead, the future of IT is hybrid. This is true for your customers, who expect you to continuously deliver a mix of different services, and for your teams, who must maintain some workloads on-premise while also supporting cloud-native apps and development.

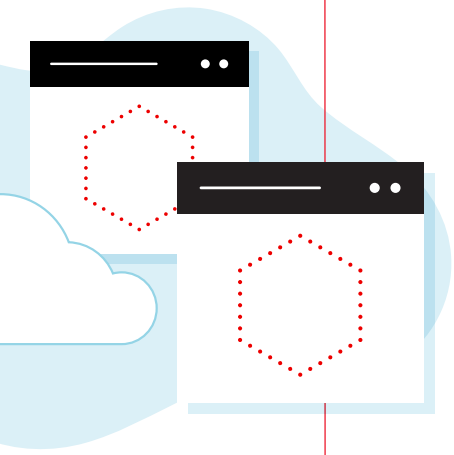
There is growing demand for easy-to-administer development platforms that deliver applications in Kubernetes-managed containers.

A complete enterprise-ready container platform has Kubernetes at the core and integrates other components for container networking, ingress and load balancing, storage, monitoring, logging, and more.

This approach turns Kubernetes from a useful container tool into a foundational platform for hybrid cloud architectures.

You want a consistent, flexible platform across every potential environment, with integration, data, analytics, and other services to support new applications. And you need the capability to bring together new clouds, tools, and integrations to solve your business challenges continually as new ones surface.

However, deciding which public and private clouds are right for each workload is complicated. What works well today may not be the best solution tomorrow, so it's important that your software is flexible enough to support future options.



Chapter 02

The value of a Kubernetes-powered container

Why it makes sense to have a Linux operating system at the foundation of your container strategy

If your organization wants to build applications faster in response to customer expectations, you need to look at the bigger picture.

Innovation and speed to market with new applications will help you beat the competition. But success depends on a delivery platform that is open, flexible, and resilient, yet supportive of traditional workloads and legacy apps and infrastructure.

You're not providing Kubernetes—you're providing a platform to allow teams to do their jobs and be successful.

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Containers are a native feature of Linux, and Kubernetes uses Linux to orchestrate containers. Even Windows containers have Linux at the core. However, a Windows operating system running Kubernetes is configured differently because containers are bolted on, instead of native.

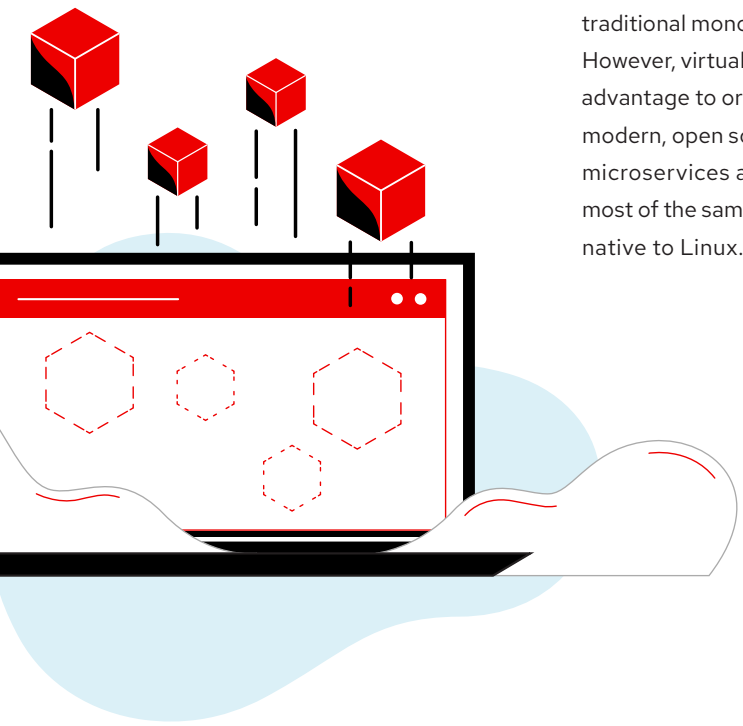
Open source flexibility: More about apps than infrastructure

At the core, containers are Linux. The apps inside containers run on Linux. Kubernetes uses Linux to manage resources.

Whatever hardware runs your infrastructure and whatever cloud deploys your modern applications, one technology works everywhere: Linux.

It's why the open source operating system revolutionizes datacenter operations, enables all the major public clouds, and continues to power new cloud-native apps. The open source Kubernetes platform is used to manage and orchestrate those containerized workloads.

Some commercial distributions of Kubernetes can include open source components, but then lock you into a proprietary platform. A truly open source distribution will always maintain open components, from the operating system all the way to the serverless dashboard.



Virtualization was magic 20 years ago. Today, this legacy infrastructure technology continues to serve traditional monolithic applications well. However, virtualization offers little advantage to organizations running modern, open source Kubernetes microservices applications because most of the same functionality is native to Linux.

The trend toward containers and cloud-native offerings encourages enterprises to move away from bloated virtualized architecture and management—and the associated pricing.

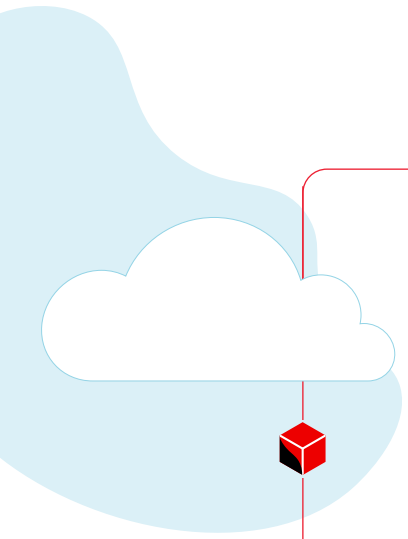
With cloud-based apps as the future of business, Kubernetes opens up a wider career path for IT administrators traditionally focused on virtual computing technology. Many are embracing automation to expand their skills, and early virtualization advocates have already moved into the cloud.

Making multicloud possible

Cloud-native technologies like containers and Kubernetes are quickly becoming the standard for building new software experiences and modernizing existing apps at scale and across clouds.

To solve business challenges, organizations need to accelerate and simplify the development and operations of cloud-native apps wherever and however they build and deploy them. With reliable cloud infrastructure in place, business transformation is all about apps.

A strong open source community has made Kubernetes the standard for running container-based apps across clouds. And as a standalone open source project, it's an effective container management tool. However, using Kubernetes by itself is not enough to succeed with hybrid cloud. To unlock its full potential as a hybrid cloud platform, organizations need to integrate an ecosystem of complementary cloud-native tools.



You need a holistic platform that doesn't force you to build in a modular way. You need to beware of vendors that cobble together a platform from bits and pieces because they're still trying to figure out their strategy.

Industry analysts provide helpful insights about where the market is headed and what vendors are pushing the innovation curve. With the growth of cloud computing, Red Hat OpenShift has been named a leader in multicloud container development platforms.[7]

[7] Forrester Research. "The Forrester Wave™: Multicloud Container Development Platforms, Q3 2020." 2020.

According to the Q3 2020 Forrester Wave report on multicloud container development platforms,

> OpenShift is the most widely deployed multicloud container platform and boasts powerful development and unified operations experiences across many public and on-premises platforms. Red Hat pioneered the 'operator' model for infrastructure and application management and provides a rich partner ecosystem and popular marketplace.[7]

Continuous innovation should be a goal for organizations. It can be achieved more easily with a platform that features an integrated development environment (IDE) for building applications that combines common developer tools into a single graphical user interface (GUI).

An IDE helps developers program new applications quickly because the setup process is faster without multiple utilities to be manually configured and integrated. With every utility represented in the same workbench, it's faster to learn how to use the tools. Other time-saving features include intelligent code completion and automated code generation, which removes the need to type out full character sequences.

[7] Forrester Research. "The Forrester Wave™: Multicloud Container Development Platforms, Q3 2020." 2020.

Chapter 03

Prepare your business for the future with Red Hat

Choose the right partner to make the most of Kubernetes and containers

Now is the time to reassess your Kubernetes stack and your container strategy, before the next wave of cloud-enabled technologies emerges. Innovations like the Internet of Things (IoT), machine learning, edge computing, and artificial intelligence will push organizations into yet another level of competitiveness.

To succeed, innovation will need to be incremental and continuous rather than a set goal. And you need a software partner that provides a tested, certified, supported ecosystem of cloud and service providers.

Innovations like the Internet of Things (IoT), machine learning, edge computing, and artificial intelligence will push organizations into yet another level of competitiveness.

> Red Hat's experience with the open source project means it understands the best cloud-native practices, tools, and integrations to support enterprise adoption of Kubernetes.

Our enterprise Kubernetes application platform, Red Hat OpenShift, is a hybrid cloud platform based on Red Hat Enterprise Linux. It gives you the benefit of standardized application and operating environments with the flexibility and consistency to deploy and manage workloads in the same way, wherever you want.

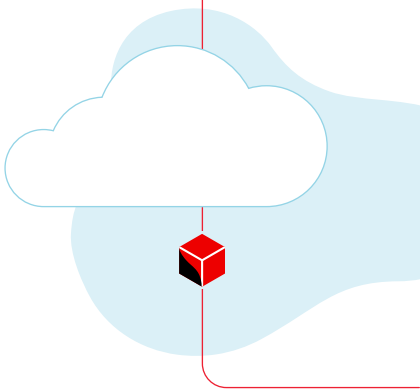
Be it public, private, or hybrid clouds, from traditional core datacenters out to broadly distributed edge locations, Red Hat OpenShift gives you the flexibility your business needs to meet your business goals. You get full visibility into the application life cycle and the freedom to deploy apps on any infrastructure.

- **Empower** your engineering teams with the resources they want while maintaining the system stability and security you need.
- **Manage** your hybrid or multicloud container platform more effectively, with less time and effort.
- **Deploy** across multiple–often incompatible–infrastructure targets.
- **Integrate** easily with existing systems, reducing operational overhead to save time and budget for strategic projects.

Red Hat's hybrid and multicloud approach spans virtualization and containers, providing stability, support, and scalability.

Red Hat OpenShift offers a modern IT infrastructure built to increase speed and efficiency from end to end. Make better use of IT budgets and resources by opting for a platform that comes with everything you need in a single stack.

Modernize legacy applications today while creating space for new innovations that will shape your business tomorrow and beyond.



IDC study on Red Hat OpenShift

Organizations are realizing significant value with the Red Hat OpenShift platform. Their ability to deliver better applications and features more quickly, while optimizing development, costs, and staff resources, is apparent in a commissioned study conducted by IDC:[8]

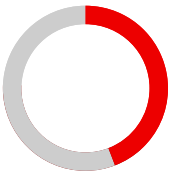
Key results:

20%
higher overall developer productivity

636%
5-year return on investment (ROI)

10
month payback period

Development benefits:



44%
more new applications

29%
faster development of new applications

Almost
3X
more new features

33%
faster development of new features

IT and business impact:

- **11%** reduction development budget for hardware and software
- **US$21.62M** higher revenue per year per organization
- **61%** less unplanned downtime
- **22%** fewer virtual servers
- **21%** more efficient IT infrastructure teams
- **33%** faster application updates

[8]IDC Business Value White Paper, sponsored by Red Hat, "The business value of Red Hat OpenShift." Doc. #US47539121, March 2021.

Benefits for business leaders, IT operators, and developers

With Red Hat OpenShift, business leaders empower their developers and IT teams to rapidly deliver the experiences customers demand. This quick response time is a competitive advantage.

The platform helps you bring new cloud-native apps and services to market faster while continuing to modernize legacy apps. It gives your team a common, consistent, and proven application foundation and helps them work more effectively through shared visibility, development life-cycle automation, and a breadth of tools, enterprise services, and support.

With increased collaboration, your team can build a DevOps culture to fuel innovation for years to come.

Red Hat OpenShift streamlines the building of container-based applications. The ability to develop applications without worrying about infrastructure gives developers the freedom to write code their way.

Your developer team can more quickly deploy containers and link services. They gain all of the capabilities of Kubernetes, backed by the support and added security that real-world applications demand. Develop apps with standards, portability, and more security—built-in and effectively managed by your IT Ops team.

The Red Hat OpenShift interface remains the same across any environment —on-premise, multicloud, public, or hybrid—allowing for consistency and speed. It's equipped with a powerful suite of developer resources, integrated tooling, and automation capabilities to manage the development life cycle with standardized workflows and continuous integration.

Red Hat OpenShift makes it easier for IT operators to deliver applications on time and on budget, with less operational complexity and more flexibility to respond to change.

A proven platform embraced by leaders in every industry

Red Hat's experience has helped thousands of customers across all vertical markets on their cloud-native journey:

- Ford Motor Company delivered faster with better collaboration among its developers across thousands of internal legacy applications and sites.
- Israel's largest bank modernized all its operations with a new IT foundation to beat the competition in delivering new digital services and features.
- The U.S. Navy transformed how it develops and deploys new functionality and warfighting capabilities to the fleet.

For these customers, and many others, Red Hat OpenShift is the platform of choice.

> ***Embrace the future with a market leader***
>
> Red Hat OpenShift is a proven platform, with proven results.[9]

[9] Forrester Research. "The Forrester Wave™: Multicloud Container Development Platforms, Q3 2020." 2020.

Conclusion

Increase the potential of your cloud solution with Red Hat OpenShift

Competing in the modern marketplace requires the speed and flexibility to adapt as customer demands change. You need to prepare your business for the future with modern technology.

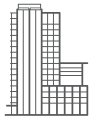
As we see 5G networks roll out over the next few years, it will push enterprises and service providers to transform yet again. Edge computing will become the next IT footprint. Companies will realize greater benefits from hybrid multicloud platforms as they move compute power closer to where data is generated.

With Red Hat OpenShift, your developers and architects can build, deploy, and manage their code pipelines with speed and efficiency–and your organization gains a stable and scalable container program for future growth.

Learn more about what makes a successful hybrid cloud strategy with tips from Red Hat.

Learn more

Red Hat



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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 integrate new and existing IT applications, develop cloud-native applications, standardize on our industry-leading operating system, and automate, secure, and manage complex environments. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500. As a strategic partner to cloud providers, system integrators, application vendors, customers, and open source communities, Red Hat can help organizations prepare for the digital future.

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