Red Hat

Prepare for cloud-native innovation with Red Hat

Considerations for using Red Hat OpenStack Platform and Red Hat OpenShift together

Contents

The future is built on cloud and container technologies

Across industries, organizations are **modernizing their applications** to increase scalability, reliability, and security while reducing costs. In fact, companies plan to modernize 78% of their custom applications within the next year.[1]

Cloud and container technologies will play key roles in these modernization efforts. 52% of enterprises consider "containerizing workloads" and 50% consider "bringing workloads to the cloud" to be key parts of application modernization.[1] To this end, organizations run 53% of their workloads and store 51% of their data in public clouds today, and expect to expand both by 6% in the next 12 months.[2]

While cloud adoption is now mainstream, many organizations are still working to move to containers. Accordingly, 27% of organizations cite expanding their use of containers as a cloud initiative for the next year.[2]

Even so, adopting containers isn't a straightforward process, and organizations struggle with a lack of internal expertise, migrating applications to containers, and managing container environments for security and compliance.[2]

Vertical spotlight: Telecommunications

The telecommunications industry will benefit greatly from cloud and container technologies. 29% of telecommunications companies have adopted a hybrid cloud strategy already,[3] and many others are beginning to move from network function virtualization (NFV) architectures to cloud-native approaches based on containers and microservices to further increase speed, efficiency, and agility.

Red Hat can help simplify your container journey, no matter where you are in the process. Running **Red Hat® OpenShift®** on **Red Hat OpenStack® Platform** gives you a clear path to cloud-native operations, on your own terms and schedule. This e-book discusses how the platforms work together to help you build your container skills and practices and migrate to cloud-native approaches over time, all while maintaining familiar, reliable operations.

*1 Red Hat. "**How enterprises approach legacy application modernization**," February 2023.*
*2 Flexera. "**Flexera 2023 State of the Cloud Report**," March 2023.*
3 2023 Global Tech Outlook, a Red Hat Report. Conducted by Red Hat via Qualtrics, May - June 2022. n = 199

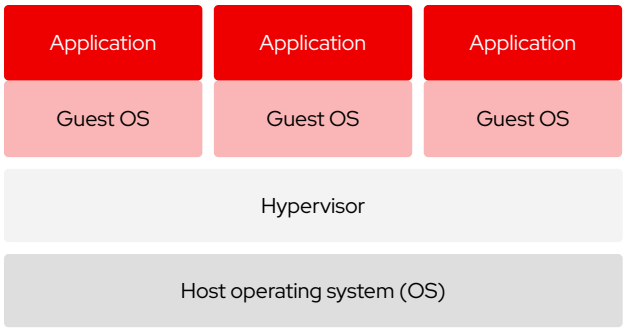
Virtual machines or containers...
What's the difference?

Understanding the differences between virtual machines and containers is critical for moving from *cloud-based operations* to *cloud-native operations*.

- **Cloud-based operations** involve deploying traditional applications in virtual machines in cloud environments to take advantage of increased scalability, flexibility, and responsiveness.
- **Cloud-native operations** involve deploying applications in containers, using microservices architectures, and adopting cloud-native methodologies like **DevOps** to accelerate development and enhance portability and reuse of application components.

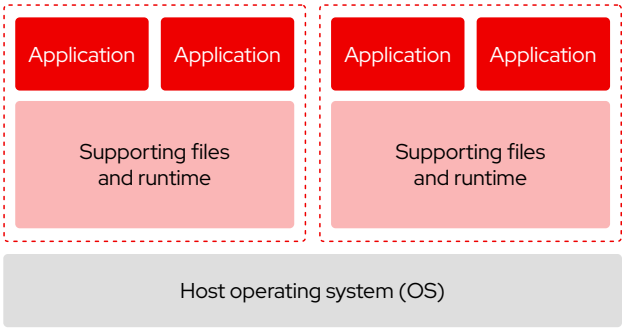
While both virtual machines and containers package IT components to isolate them from the underlying infrastructure, the approaches have key differences in terms of scale and portability.

Virtual machines



Virtual machines are typically larger and include a complete operating system, so they can perform multiple resource-intensive functions at the same time. They can abstract, split, duplicate, and emulate entire servers, operating systems, desktops, databases, and networks.

Containers



Containers are generally smaller and contain only an application and the files necessary to run it. They can also be used to package **microservices**, functions that perform specific tasks.

So what do these differences mean in practice? It comes down to several key factors:

- **Portability.** While virtual machines can be moved across environments, it can be a fairly complex process as they include a complete operating system and deeper dependencies. Because containers are packaged with their entire runtime environment and all necessary files, the process of moving them across environments is simplified.
- **Capability.** Virtual machines are capable of running far more operations and services than a single container, which is why they are still used for many traditional workloads that have not yet been modernized.
- **Development approach.** Traditional development approaches result in monolithic application architectures that incorporate all aspects of the application into a single package, ideally run in a virtual machine. Cloud-native and DevOps approaches break applications down into the smallest possible serviceable units possible – usually a function or microservice – which are best packaged in containers. There are many considerations around whether to keep an application as-is or to modernize it. **Read the e-book** to learn more about these considerations. →
- **Customization.** Virtual machines can be greatly customized to fit the exact needs of each application and use case, but that customization comes at the cost of larger size, less portability, and slower deployment speed. Containers are built as pre-packaged applications and dependencies, so they are faster to build, deploy, and move across environments.
- **Scalability.** Due to their size and architecture, containers are extremely fast and consistent to scale. Virtual machines are also very scalable, but take more effort and time to do so.

Overall, virtual machines offer more capabilities and customization, while containers provide more consistency, portability, and scale.

Moving from virtual machines to containers takes careful planning and deliberate effort. This journey can be complicated and time consuming, as your organization deploys the technologies and learns the skills needed to successfully support cloud-native operations.

Learn more about the differences between virtual machines and containers.

Read the **article**. →

That's where Red Hat comes in. Our expertise, technologies, and services provide a clear path forward to cloud-native operations.

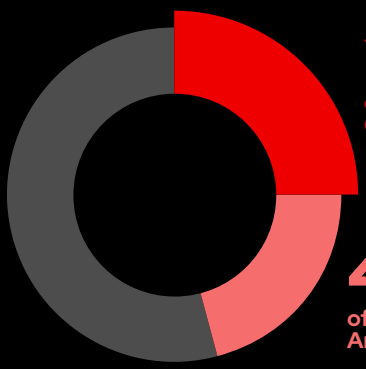
Start your cloud-native journey with help from the experts

As a leader in enterprise open source solutions, Red Hat can help you on your journey to cloud-native operations, no matter where you are today. Our long-standing open approach to innovation gives us the expertise needed to deliver the platforms, tools, and resources that power our customers' innovation. We have been delivering enterprise-grade open source software for more than 25 years and are leading contributors to both the OpenStack and Kubernetes communities. Our upstream approach to development contributes the improvements we make back to the community project to ensure ongoing interoperability, collaboration, and innovation. We also offer long-term support life cycles for our platforms, giving you the time you need to adopt new technology at your pace and generate return on your investments.

Red Hat OpenStack Platform and Red Hat OpenShift work together to give you a flexible, production-grade foundation that supports your organization and initiatives throughout your cloud-native journey.

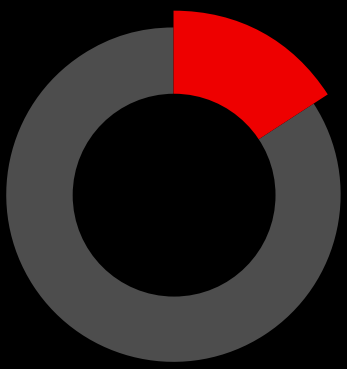
Red Hat is a leader in open source communities

Red Hat is the #1 corporate contributor of commits to the OpenStack project, and is the #2 corporate contributor of commits to the Kubernetes project over all releases.[4,5]



25%
of commits over all OpenStack releases[4]

46%
of commits to the Antelope release[4]



16%
of commits over all Kubernetes releases[5]

4 OpenStack project commits from Stackalytics.com, accessed 28 April 2023.
5 Kubernetes project commits from Stackalytics.com, accessed 28 April 2023.

Red Hat OpenStack Platform

Red Hat OpenStack Platform is a cloud computing platform that virtualizes resources from industry-standard hardware, organizes them into clouds, and manages them so users can access what they need on demand. It's a proven foundation for creating, scaling, and managing reliable public or private cloud environments with high security.

Red Hat OpenShift

Red Hat OpenShift is a production-ready application platform for cloud-native innovation. Powered by containers, Kubernetes, and DevSecOps capabilities, it provides a foundation for rapidly building, deploying, running, and managing existing and new applications at scale, with security, across **hybrid** and **multicloud** environments.

Red Hat OpenStack Platform and Red Hat OpenShift build on the trusted foundation of **Red Hat Enterprise Linux®**, expanding the reliability, performance, and security of the operating system through the entire software stack. The platforms are co-engineered and developed together for reliable interoperability and to make the most of each platform's capabilities over time. Red Hat supports both platforms together, simplifying and streamlining issue resolution. Our engineering and support experts work together to solve problems quickly and with less hassle. We also offer **services and training** to help you adopt Red Hat OpenStack and Red Hat OpenShift together successfully.

Deploying Red Hat OpenShift on Red Hat OpenStack Platform lets you run both virtualized and containerized applications and workloads, side by side, with bare-metal performance, so you can progress on your cloud-native journey more easily. Key integrations—including aligned networking, storage, and management—streamline interoperability and let you run both platforms on the same underlying infrastructure. IT operations can run virtual machines on Red Hat OpenStack Platform, and manage them using your existing processes. Developers can create containerized workloads on Red Hat OpenShift, and deploy them using cloud-native operations. This gives your teams an opportunity to get started with cloud-native operations and develop their skills in a low-risk setting. When you're ready, you can modernize and migrate your applications from Red Hat OpenStack Platform to OpenShift.

Benefits of running Red Hat OpenShift on Red Hat OpenStack Platform

- Save IT infrastructure and operations costs.
- Improve workload flexibility and scalability.
- Simplify management and orchestration.
- Build a path to cloud-native operations.

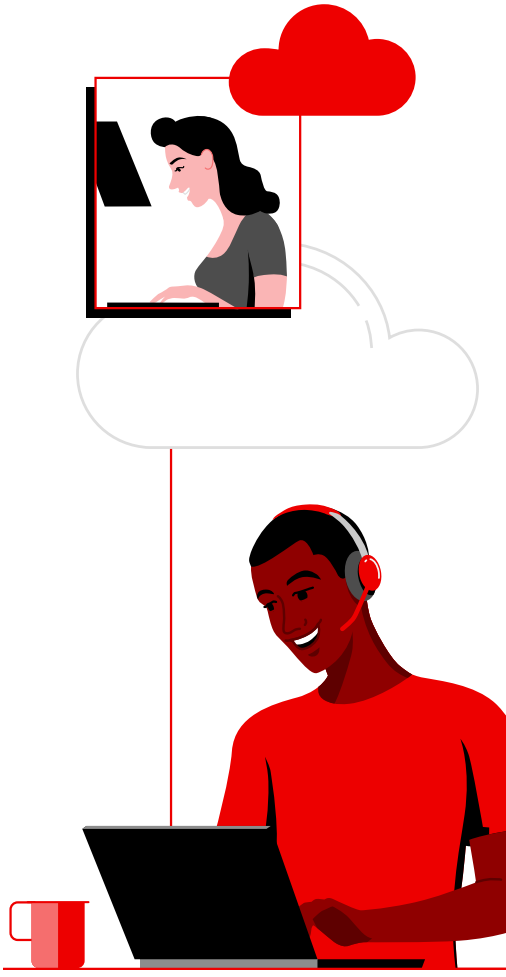
Get help from the experts

Planning your cloud-native journey can be a daunting task. Red Hat can help your organization develop the practices, tools, and culture needed to more efficiently modernize existing applications and build new cloud-native ones. Our mentor-based approach gives your teams information straight from the source and teaches them the skills they need to adopt cloud-native operations. Red Hat experts with diverse technical experience work with your staff in a collaborative, hands-on manner to ensure success. In fact, customers that engage Red Hat Services and Support offerings for Red Hat OpenShift experience 703% return on investment.[6]

Get started with a one-day, **no-cost consulting discovery session**. Our experts work with you to identify business objectives and provide a tailored project approach to meet your goals.

Our training offerings also pair well with consulting engagements. Red Hat Training helps your teams build the skills to evolve with changing IT needs. Our flexible curriculum lets you choose from courses that teach everything from managing and deploying containers to implementing microservices and DevOps processes.

Take our **free skills assessment** to find the best place to begin. →



6 *Forrester Consulting study, commissioned by Red Hat. "The Total Economic Impact™ Of Red Hat Services And Support For OpenShift," May 2022.*

Build a foundation for 5G

Running Red Hat OpenShift on Red Hat OpenStack Platform gives telecommunications companies a foundation for moving to 5G while still supporting 4G customers. Tight integration between the platforms provides optimized network capacity and performance, enhanced security capabilities, and greater efficiency. Built-in security capabilities that extend throughout the software stack and application life cycle let you enforce security and compliance without compromising development and deployment speed.

Read the e-book to discover more about open transformation and 5G evolution in the telecommunications industry. →

proximus

Belgium's largest telecommunications provider, **Proximus Group** sought to replace its costly bare-metal server environment with a flexible, scalable NFV approach by standardizing on Red Hat OpenStack Platform, supported by Red Hat OpenShift and **Red Hat Ceph® Storage**. Proximus worked closely with Red Hat Consulting over two weeks to design an architecture, then deploy and optimize the solution.

Read the **success story**. →

Reduced application scaling costs by 20%

Improved developer speed and efficiency

Generated €30,000 in savings each month

"As we continue our transformation journey, Red Hat OpenStack Platform and Red Hat OpenShift will continue to play a crucial role. With Red Hat, we are confident our platform will deliver the performance and stability we need to deliver our new offerings with the high service levels our customers expect."

Jan van Hoorick
Network & Service Platform Architect, Proximus Group

Begin your journey to cloud-native operations

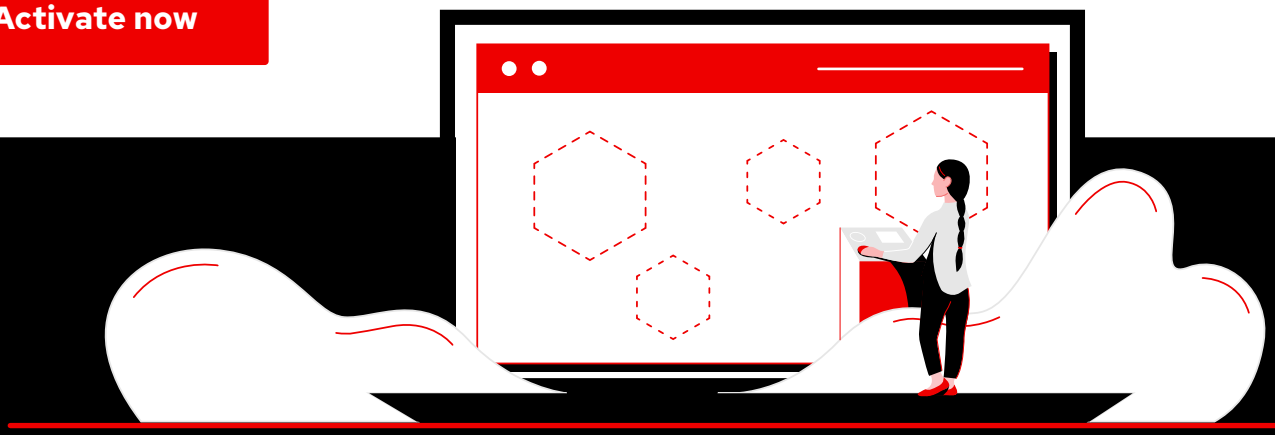
Cloud and container technologies will fuel innovation for the future.

Red Hat simplifies your journey to cloud-native operations with an integrated, supported foundation for running both virtualized and containerized applications and workloads. Combine the scalability, flexibility, and automation of Red Hat OpenStack Platform with the containerization, automation, and integration capabilities of Red Hat OpenShift to develop and deploy your applications more quickly and efficiently.

Try Red Hat OpenShift on Red Hat OpenStack at no cost

Through our Level Up program, eligible Red Hat OpenStack Platform customers can try Red Hat OpenShift at no cost for 1 year. Register today to get no-cost, fully supported access to Red Hat OpenShift Platform Plus.

Activate now



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