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CONTAINER-NATIVE VIRTUALIZATION

FREQUENTLY ASKED QUESTIONS

INTRODUCTION

Container-native virtualization addresses the needs of development teams that have adopted or want to adopt Kubernetes but possess existing virtual machine (VM)-based workloads that cannot be easily containerized. This technology provides a unified development platform where developers can build, modify, and deploy applications residing in application containers and VMs in a shared environment. These capabilities support rapid application modernization across the open hybrid cloud.

With container-native virtualization, teams that rely heavily on existing VM-based workloads can containerize applications faster. With virtualized workloads placed directly in development workflows, teams can divide them over time while still using remaining virtualized components as desired.

The container-native virtualization will be available to customers who purchase Red Hat Cloud Suite. Red Hat Cloud Suite is an open source, integrated, and supported platform that supports digital transformation initiatives through traditional or containerized workloads. Key Red Hat Cloud Suite components include OpenShift Container Platform, Red Hat OpenStack® Platform, Red Hat Virtualization, and Red Hat CloudForms® for holistic hybrid cloud management.

FREQUENTLY ASKED QUESTIONS

QUESTION: What is container-native virtualization?

ANSWER: Container-native virtualization is a new feature of Red Hat Cloud Suite that lets developers bring existing VMs into workflows on OpenShift Container Platform. Container-native virtualization represents a continuation of Red Hat's commitment to Kubernetes as the future of application orchestration and a common standard across the open hybrid cloud.

QUESTION: What does container-native virtualization do?

ANSWER: Container-native virtualization supports migration of existing virtualized workloads directly into the development workflows supported by OpenShift Container Platform. This capability speeds application modernization by:

- Supporting development of new, microservices-based applications in containers that interact with existing virtualized applications.
- Combining existing virtualized workloads with new container workloads on the same platform, making it easier to gradually divide monolithic, virtualized workloads into containers.

VMs running in container-native virtualization continue to use the same trusted Red Hat Enterprise Linux® hypervisor, Kernel-based Virtual Machine (KVM), as Red Hat Virtualization and Red Hat OpenStack Platform.

QUESTION: What are the key customer benefits of container-native virtualization?

ANSWER: Container-native virtualization lets teams develop containerized applications faster by hosting VM-based workloads on the same platform as container-based applications. This feature supports the division of existing workloads, as well as continued use of virtualized applications that are dependencies for new, microservices-based applications. As a result, container-native virtualization helps organizations achieve their digital transformation goals.

QUESTION: What are the key use cases for container-native virtualization?

ANSWER: Container-native virtualization helps technology teams modernize application development and optimize their IT infrastructure.

- **Modernizing application development:** In this use case, developers incorporate existing applications and components into their workflows while simultaneously building new, complex applications. Container-native virtualization lets teams that rely heavily on existing VM technology to evolve to developing containerized applications faster. It also provides a way to divide complex virtualized applications gradually while continuing to run remaining virtualized components. As developers modernize existing applications, container-native virtualization provides a way to run VMs in Kubernetes pods alongside normal pods made up of application containers on OpenShift Container Platform. It supports connectivity between application containers and VMs, while also letting VMs share networking and storage infrastructure with application containers.
- **Optimize IT infrastructure:** As development teams embrace new workload footprints, operations teams need efficient ways to manage them alongside existing investments. Container-native virtualization helps optimize IT by providing a unified way to deploy, run, and manage containerized and virtualized workloads on the same platform. It also supports reuse of existing storage solutions certified for the Red Hat OpenStack Cinder ecosystem, helping operations save money and protect investments.

QUESTION: How does container-native virtualization work?

ANSWER: Red Hat Cloud Suite includes OpenShift Container Platform, with container-native virtualization for developers who need to run virtualized workloads. When container-native virtualization is equipped for a cluster, developers can create and add virtualized applications to their projects from the service catalog in the same way they would for a containerized application. The resulting VMs can run in parallel on the same OpenShift nodes as application containers.

QUESTION: Is container-native virtualization a product?

ANSWER: Container-native virtualization is a feature, not a product. It is based on the upstream, open source KubeVirt project and will first be released as a technology preview with code embedded in OpenShift Container Platform.

Support for this feature will be available for customers who have purchased Red Hat Cloud Suite. Red Hat Cloud Suite is an integrated software bundle that includes OpenShift Container Platform, Red Hat Virtualization, and Red Hat OpenStack Platform, optimized to work with Red Hat CloudForms to provide massively scalable cloud infrastructure and a unified management framework. With these included offerings, Cloud Suite helps organizations solve specific business challenges with increased ease of use and management.

QUESTION: When will container-native virtualization be available?

ANSWER: Container-native virtualization will first be made available as a technology preview aligned with a future version of OpenShift Container Platform to be included in Red Hat Cloud Suite. Exact timing will be based on customer and partner feedback and adoption rates.

QUESTION: How will container-native virtualization be made available?

ANSWER: Container-native virtualization will be made available to Red Hat Cloud Suite customers via the Red Hat container catalog.

QUESTION: How does container-native virtualization differ from other Red Hat virtualization solutions?

ANSWER: Red Hat Virtualization and Red Hat OpenStack Platform manage virtualization environments for datacenter and private cloud use cases for the host infrastructure—including networking, storage, and computing—and the VMs respectively.

In contrast, container-native virtualization is a feature offered as part of Red Hat Cloud Suite that lets developers import and develop with existing VMs alongside containerized applications they are building in OpenShift Container Platform.

All of these solutions are optimized to work together and with the management capabilities of Red Hat CloudForms and Red Hat Cloud Suite.

QUESTION: What hypervisor is used by container-native virtualization?

ANSWER: VMs running in container-native virtualization continue to use the same trusted Red Hat Enterprise Linux hypervisor, KVM, as Red Hat Virtualization and Red Hat OpenStack Platform.

QUESTION: What is the difference between container-native virtualization and Katacontainers?

ANSWER: Container-native virtualization supports migration of existing virtualized workloads directly into OpenShift Container Platform development workflows. Full operating system VMs can be run in OpenShift clusters with little or no modification. Container-native virtualization is based on the KubeVirt project.

In contrast, the Katacontainers project focuses on using hardware-assisted virtualization technology to provide secure isolation of workloads that have already been deconstructed into application containers.

Container-native virtualization is focused on running and managing existing VMs as if they were containers, while Katacontainers is focused on running applications containers within VMs to increase their isolation from a security perspective.

Red Hat is a sponsor of both projects and view them as complementary solutions that take advantage of the strength and reliability of Linux virtualization, including the KVM hypervisor.

QUESTION: What is the difference between container-native virtualization and OpenStack Magnum?

ANSWER: Magnum, the OpenStack container infrastructure management project, deploys container orchestration engines—such as Kubernetes, Mesos, and Swarm—on OpenStack VMs or bare metal using the OpenStack orchestration service, Heat. Once the container orchestration engine is deployed, users interact with container clusters using native tools for that orchestration engine, such as kubectl. An OpenStack installation with Magnum supports both virtualized and containerized workloads, with different schedulers and different application programming interfaces (APIs) used for VMs and containers.

FAQ Container-native virtualization

Red Hat does not currently support OpenStack Magnum in Red Hat OpenStack Platform and does not plan to do so. Instead, Red Hat is focused on automating OpenShift deployment and management in an environment-agnostic way using Red Hat Ansible® Automation and native interfaces, such as Heat. In this way, Red Hat ensures applications' technical independence from the underlying infrastructure—whether it is running in a physical, virtual, or cloud environment.

Container-native virtualization helps customers modernize applications by unifying the creation, scheduling, and management of containers and VM workloads in OpenShift Container Platform.

QUESTION: Is container-native virtualization open source?

ANSWER: Yes, container-native virtualization is based on the upstream KubeVirt project, the source code to which is available under the Apache Software License 2.0.

QUESTION: How does container-native virtualization enhance OpenShift Container Platform?

ANSWER: Container-native virtualization is ideal for teams that are shifting to cloud-native application development and have a large investment in existing VM technology. It supports development of containerized applications by bringing virtualized application dependencies into the rich development environment of OpenShift Container Platform. Container-native virtualization enhances OpenShift Container Platform by providing VM-based services.

LEARN MORE

If you are a Red Hat customer and have additional questions, contact your account representative or visit redhat.com/en/contact-sales.

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Red Hat is the world's leading provider of open source software solutions, using a community-powered approach to provide reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.

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NORTH AMERICA
1 888 REDHAT1

EUROPE, MIDDLE EAST, AND AFRICA
00800 7334 2835
europe@redhat.com

ASIA PACIFIC
+65 6490 4200
apac@redhat.com

LATIN AMERICA
+54 11 4329 7300
info-latam@redhat.com

redhat.com
#F12404_0518