DEPLOY A CONTAINER-BASED HYBRID CLOUD WITH RED HAT AND MICROSOFT

TECHNOLOGY OVERVIEW

65%

of IT organizations are actively using container technology to realize gains in flexibility, efficiency, and cost savings.[1]
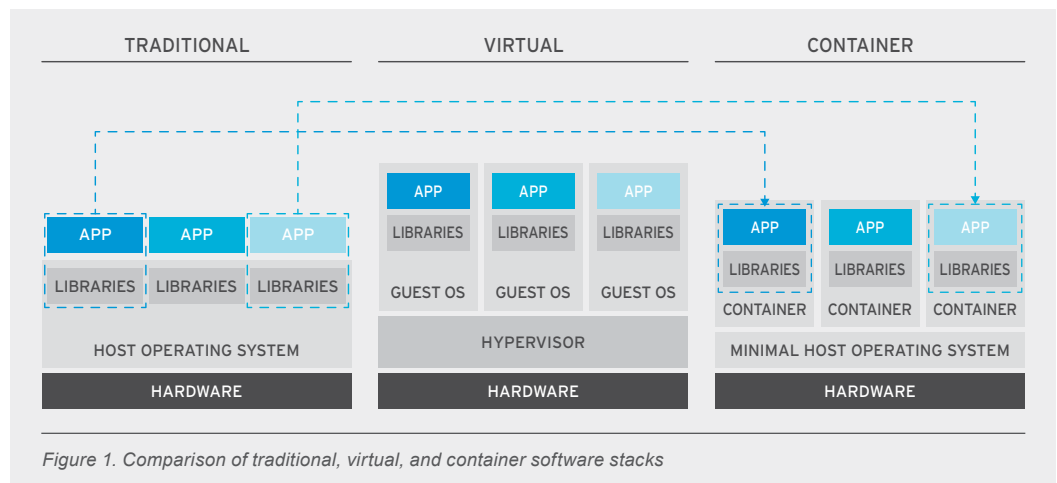
EVOLUTION DRIVES DIGITAL TRANSFORMATION

In the modern digital economy, exceeding customer expectations and remaining competitive are challenges for all businesses. Many organizations meet these challenges by digitally transforming and building cloud-native infrastructure. Using emerging technologies and cultural innovation, they deliver dynamic, personalized digital customer experiences while improving or replacing internal business practices.

Successful digital transformation requires evolution in applications, processes, and infrastructure. Adopting new application architectures enables fast and flexible delivery of new features to acceler- ate business value. Deploying agile business processes improves operational efficiency and speeds response to changing market conditions. Finally, modernizing existing and building new cloud-based infrastructure allows organizations to better control costs and take advantage of emerging innovation. Containers are one of the technologies that enable this digital transformation.

WHAT ARE CONTAINERS?

Containerization is a method of operating system virtualization. As shown in Figure 1, a container is a lightweight process built on top of the Linux® or Windows host operating system. It provides a logical execution environment for applications. A containerized environment eliminates the guest operating system used in other virtualization methods, allowing applications to run with minimal overhead. This results in improved performance and reduced costs.

In a containerized environment, applications are packaged with library dependencies and moved into a container. This allows applications to be easily ported across different environments. In each envi- ronment, the host operating system provides containers with resource management, abstraction, and security capabilities while enforcing container resource quotas and isolation.

Figure 1. Comparison of traditional, virtual, and container software stacks

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1 "Building trust in a cloudy sky." McAfee. 2017. mcafee.com/us/solutions/lp/cloud-security-report.html.

TRANSFORM YOUR APPLICATIONS, PROCESSES, AND INFRASTRUCTURE

Digital transformation initiatives can use containers—integrated with a container platform that provides development and deployment capabilities—to fundamentally change applications, processes, and infrastructure. Application life-cycle management, build automation, and continuous integration/continuous deployment (CI/CD) capabilities make containers an ideal development foundation. Plus, automated deployment, scaling, and management functionality allow containers to operate across hybrid environments alongside existing applications and IT investments.

APPLICATIONS

Using containers, you can architect modern applications that are faster to build and easier to change, speeding time to market for new applications and features. As the building blocks of modern applications, microservices are minimal, complete, and composable services with limited dependencies. By efficiently packaging microservices in containers, they can be deployed and updated quickly and independently. Additionally, container platforms manage microservice deployments at scale and provide integrated service discovery and orchestration.

PROCESSES

Containers also help you adopt agile development processes that increase efficiency and collaboration between development and operations teams. By packaging applications and dependencies into containers, developers can provide operations with a consistent management process for all applications. Immutable application packages can easily be moved between development, test, and production environments without rebuilding the application. As a result, development and operations can use a single, shared container platform that addresses both teams' core requirements.
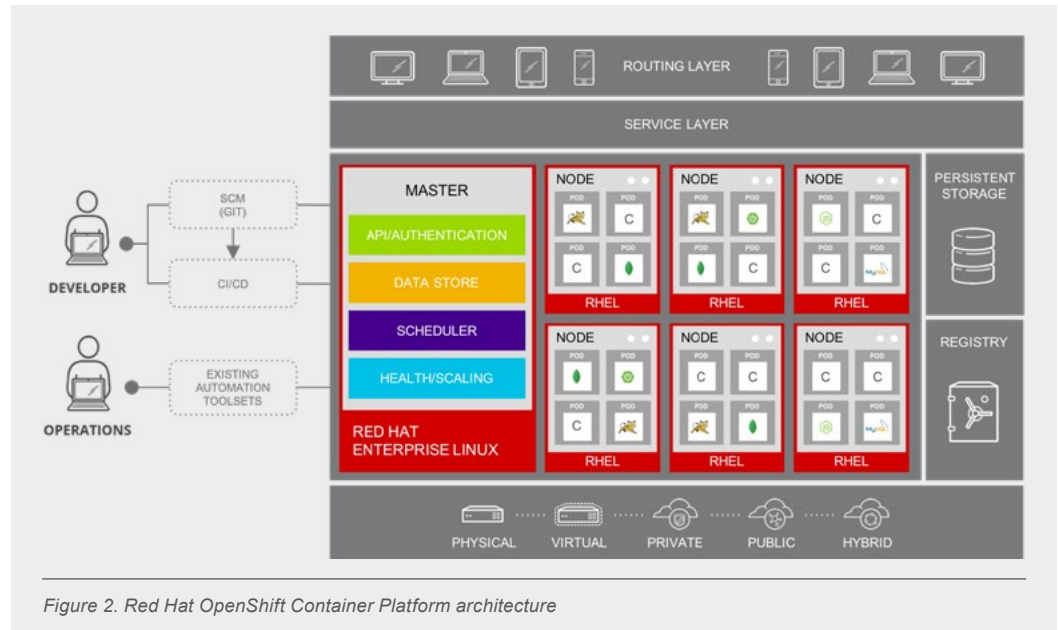
INFRASTRUCTURE

Containerized applications and services scale easily across hybrid environments that span public and private cloud infrastructure, giving you choice and flexibility for enterprise workloads. Containers provide a standard and portable package that can be deployed on Linux installations across physical and virtual machines in any cloud environment, resulting in consistent, rapid application deployment.

ADOPT CONTAINERS WITH RED HAT AND MICROSOFT

Red Hat and Microsoft provide a production-ready, containerized environment with a hybrid cloud foundation. Built on proven open source technologies, including Docker and Kubernetes, Red Hat® OpenShift Container Platform, shown in Figure 2, is an enterprise-grade container application platform. It provides container orchestration using Kubernetes—the open source, highly scalable, self-healing container management platform. Self-service capabilities let you develop, deploy, and manage traditional and container-based applications seamlessly across physical, virtual, and public cloud infrastructures. Advanced security features help protect your containerized environment by preventing tenants from compromising other containers or the underlying host.

Spread across 42 regions, Microsoft Azure is a global network of some of the world's largest datacenters that integrates seamlessly with your on-premise datacenter. It provides a comprehensive set of cloud services for building, deploying, and managing the most demanding container-based applications across environments. A set of more than 70 compliance offerings helps you keep resources in alignment with regulations and policies. Additionally, Microsoft Azure Security Center supplies a central view of your Azure resources to aid in threat detection and mitigation. Azure Active Directory provides identity governance and access management that works seamlessly with Red Hat OpenShift Container Platform.

Figure 2. Red Hat OpenShift Container Platform architecture

Combining the native high-availability features of Microsoft Azure with the advanced application management capabilities of Red Hat OpenShift Container Platform creates a reliable, stable container-ready environment. The Red Hat OpenShift Container Platform interface lets you easily create and deploy applications on Microsoft Azure using Linux-based microservices. Migrating on-premise development and test environments to a container-ready environment can also improve performance, flexibility, and control.

Red Hat and Microsoft deliver the resources needed for digital transformation. Working together, the companies provide an integrated, enterprise-grade support system for Red Hat solutions running on Microsoft Azure. This provides customers worldwide with access to support staff from both Red Hat and Microsoft, an integrated ticketing system, powerful portal integration, and a seamless, coordinated escalation and resolution process. Plus, you gain access to the one of the largest ecosystems of certified partner solutions and one of the most extensive communities of partners and experts.

ACCELERATE TIME TO MARKET WITH MODERN APPLICATIONS

Organizations are actively developing production-grade, microservice-based applications to rapidly deliver new services and features to customers and realize business value sooner. More than 30% of IT professionals are currently running microservices in production, while 20% are piloting microservices for production deployment.[2]

Red Hat and Microsoft provide the tools you need to build and deploy modern, microservice-based applications. Simplify the creation of container images using automated workflows. Build both stateful and stateless applications with attached, persistent storage. Deploy and manage microservices and applications quickly and easily through load-balancing, autoscaling, and Kubernetes-based orchestration capabilities.

2 *"Enterprise Development Trends 2016." Lightbend. 2016.* info.lightbend.com/COLL-20XX-Enterprise-Development-Trends-2016-Report_RES-LP.html.

RESPOND TO CHANGING CONDITIONS FASTER

Agile development processes can help you improve operational efficiency and respond faster to dynamic market conditions. Continuous delivery—an engineering approach of building, testing, and releasing software faster and more frequently—is a key component of these processes. In fact, continuous delivery significantly contributes to both lower deployment pain and higher IT performance.[3]

Red Hat OpenShift Container Platform and Microsoft Azure supply tools and capabilities to help you adopt agile development processes and develop and update applications faster. Rapidly enact changes for container-based applications using policy-based control and automation. Dynamically scale to meet changing demand with flexible, cloud-based resources.

BUILD A FLEXIBLE, COST-EFFICIENT DATACENTER

57% of organizations are running a hybrid public/private architecture today.[4] A scalable, manageable hybrid cloud environment can help you control costs while taking advantage of emerging technology.

Red Hat and Microsoft deliver the expertise and support you need to build cost-effective hybrid cloud environments. Containerizing and running applications with Red Hat OpenShift Container Platform gives you a seamless, consistent deployment process across all Microsoft Azure and on-premise resources. Place applications where it makes the most sense now and move them as requirements evolve. Dynamically scale applications and resources in line with changing demand. Pay only for the resources you use with flexible, pay-as-you-go pricing options for Microsoft Azure. Further reduce costs by taking advantage of the Red Hat Cloud Access program to move your unused Red Hat product subscriptions to Microsoft Azure.

MOVE BUSINESS FORWARD WITH DIGITAL TRANSFORMATION

To remain successful in the digital age, organizations across industries are adopting new approaches to applications, processes, and infrastructure. Red Hat and Microsoft offer an enterprise-grade, container-ready hybrid cloud environment that lets you use agile development processes to quickly build and deploy modern, microservice-based applications that can help your business move forward.

Contact your Red Hat or Microsoft sales representative to learn more about using containers to transform your organization. For technical details about this solution, consult the Deploying Red Hat Openshift Container Platform 3.5 on Microsoft Azure reference architecture and the Red Hat OpenShift Container Platform on Microsoft Azure test drive.

Learn more at redhat.com/openshift and azure.com/redhat.

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3 "2017 State of DevOps Report." Puppet Labs and DORA. 2017. puppet.com/resources/whitepaper/state-of-devops-report.

4 "Building trust in a cloudy sky." McAfee. 2017. mcafee.com/us/solutions/lp/cloud-security-report.html.