REPACKAGE APPS WITH CONTAINERS
Modernize with vSphere Integrated Containers

Accelerate Application Development and Deployment

Digital transformation is fundamentally disrupting how software is developed and deployed. Companies are under pressure to rapidly create innovative software that engages their customers and provides new services. Improving time to market is paramount. As a result, companies are turning to container technology to modernize their data centers and streamline software development.

Containers package an application and its dependencies into a distributable image that can run almost anywhere. The packaging and portability of containers support modern architectural patterns and make developers more efficient.

By provisioning and hosting containers, VMware® vSphere® Integrated Containers™ prepares your data center for the digital era. The solution moves you one step closer to a modernized software-defined data center that deploys infrastructure, services, data, and applications on demand. For a traditional application, however, a common first step toward modernization is repackaging part or all of it in a container.

Challenges Impeding Application Repackaging

Most infrastructure platforms are not designed to run traditional and modern applications side by side while working with existing hardware and software, making it difficult to repackage a traditional application with containers. Beyond the infrastructure, modern applications pose their own challenges. Modern apps change frequently, are developed in short release cycles, and might be built with microservices. In addition, IT teams need to connect applications across clouds and devices with security, compliance, and availability.

But you can establish a consistent operational model for infrastructure and application delivery that works with both traditional and containerized applications. The model creates a powerful bridge to move from traditional software development practices to new, more flexible forms geared toward innovation, speed of execution, and easier maintenance.

Run Modern Applications with vSphere Integrated Containers

vSphere Integrated Containers creates an enterprise container infrastructure within vSphere. The integrated solution includes a container runtime engine, a container management portal and an image registry. The portal's user interface helps you manage container repositories, images, hosts, and instances. The registry lets developers create container repositories to host their images.

These capabilities enable VMware customers to deliver a production-ready enterprise container solution to their development teams without having to build out a separate, dedicated container infrastructure stack. By supporting containers in their VMware vSphere environments, IT teams gain the security, isolation, and management of virtual machines (VMs), and developers can exploit the flexibility of containers.

THE BENEFITS OF REPACKAGING APPS IN A CONTAINER

Advantages of repackaging a traditional app in a container and running it with vSphere Integrated Containers:

• Ease application maintenance

• Minimize disruption to operations and reduce costs by using existing VMware infrastructure

• Simplify workflows to accelerate development

• Fix an application's vulnerabilities

• Impose a consistent environment across development, testing and production

• Enhance portability

• Streamline app deployment by using Docker

• Improve the app's time to market

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vSphere Integrated Containers Architecture

The architecture of vSphere Integrated Containers gives you two container deployment models:

• **Virtual container hosts**: vSphere Integrated Containers takes advantage of the native constructs of vSphere to provision containers. By deploying each container image as a virtual machine, vSphere Integrated Containers extends the availability and performance features of vSphere to containerized workloads, including vSphere High Availability, vSphere vMotion®, and vSphere Distributed Resource Scheduler™. In addition, developers can consume a Docker API.

• **Docker container hosts:** Developers can self-provision Docker container hosts on demand and use them as a development sandbox to repackage apps.

This architecture complements agile development practices and DevOps methodologies such as continuous integration and continuous deployment (CI/CD).
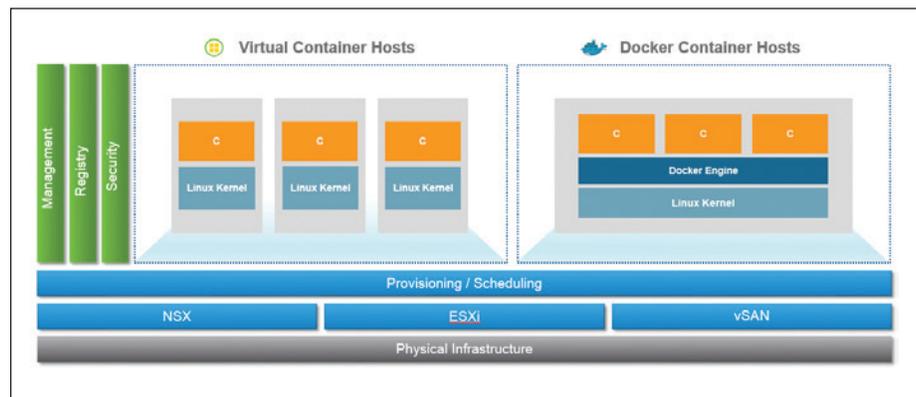

FIGURE 1. High-level architecture of vSphere Integrated Containers

Repackage Applications for Efficiency

It can be costly and time-consuming to re-architect an in-house application that is too coupled to its data or other application components. For an application with a well-defined architecture that tightly couples data with application logic, it makes sense to repackage the application in a container without having to modify the application's design. In addition, the learning curve for repackaging an application or part of it, such as the web front end, is small.

vSphere Integrated Containers provides an alternate way to instantiate a Docker image by letting you use the Docker command-line interface and then deploy the container image as a VM instead of as a container on top of a Docker host. As a result, you reap the benefits of packaging the application as a container without re-architecting it. This approach keeps the isolation benefits of VMs.

vSphere Integrated Containers is ideally suited to application repackaging. No new infrastructure or dedicated hardware is required to repackage the application, nor do you need to implement new tooling. The repackaged containerized application can run alongside other virtual machines running other applications, whether traditional or containerized. To support the repackaged container, vSphere Integrated Containers provides high availability at the infrastructure level without developer intervention. You can also use such core vSphere features as vSphere High Availability and vSphere vMotion.

Simplifying Maintenance

Containers simplify application maintenance. After you repackage an app in a container, maintenance activities such as upgrading, updating, and patching become easier. The Docker file, in particular, eases patches and upgrades.

Unifying Containerized Applications with vSphere

Docker furnishes a platform with which developers can rapidly build applications on their laptops and then port them to vSphere Integrated Containers. A developer working on a traditional Java application running on Apache Tomcat, for example, can containerize the application and then, because of its inherent portability, shift it to a virtual container host provisioned by a vSphere administrator.

The developer can then push the container image to the vSphere Integrated Containers registry, tag it, and run it in the virtual container host. At the same time, an administrator of VMware vCenter® can see the container VM in the vSphere inventory. The developer or the administrator can use the monitoring page in the vSphere Integrated Containers portal to view statistics and logs. This unification is made possible in part by the vSphere Integrated Containers management portal, which is integrated with identity management to securely provision containers. The result enables application development teams to repackage, test, and deploy applications quickly and efficiently.

For more information on vSphere Integrated Containers, visit www.vmware.com/products/vsphere/integrated-containers or contact your VMware representative.

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