

5 key considerations for IT teams moving to containers

Container use continues to grow

IT organizations continue to adopt containers as they realize the benefits of such technology. Compared to virtual machines, containers are more portable, require less effort and time to scale and deploy, and use fewer system resources. In fact, 79% of organizations use containers for at least a few production applications.¹ Still, building and deploying containerized applications at scale brings new IT challenges to solve.

Here are 5 key considerations when moving to containerized environments.

1 Build and deployment pipelines

Manually building and deploying container images can be a time-consuming, error-prone process. You need to determine the best way to gather content from development teams, which base images to use, where to place your applications, how to add containers to registries, and how to make your container hosts download and deploy images. Finally, you also need to verify that the whole process completes successfully. Standardized build and deployment pipelines ensure that the same, agreed-upon process is followed every time you create a container image.

Building, testing, deploying, and updating high-quality containerized applications require efficient, repeatable processes. Build and deployment pipelines use advanced, automated tools to perform these processes consistently and reliably. These pipelines run every time you update or change any software within the container, ensuring that container images are consistent and complete.

Pipelines also help catch errors before they are deployed to production, improving quality and reliability. By automating container image testing and deployment, software development processes become faster and more efficient.

Recommendation: Look for tools that automatically perform pre-defined processes to manage your build and deployment pipelines.

2 Container compatibility

Containers guarantee portability, not compatibility. **Portability** means that you can place and move container images across different container platforms and environments. Because the Open Containers Initiative (OCI) defines the image and distribution formats for containers, all container platforms, hosts, and registries can consume the same container images.

Compatibility—the ability for an image to run on a host—is based on hardware architecture and operating system distribution and version. As a result, not all container images are compatible with all hosts. Instead, images and hosts should be designed, engineered, and tested to work together to minimize potential issues.

Recommendation: Choose an enterprise, Kubernetes-based application platform and container host that let you deploy and run applications anywhere—from physical and virtualized systems to private and public clouds. Also, make sure that the base or builder images used in your build and deployment pipeline are compatible with the container hosts used within your application platform.

¹ Cloud Native Computing Foundation. "Cloud Native Computing Foundation Annual Survey 2022," 2022.

3 Monitoring

Kubernetes-based application platforms can rapidly create and destroy container instances. This makes it difficult to manually ensure that applications are running optimally, identify and prevent issues, and improve overall resource management and efficiency.

Monitoring helps maintain the reliability and stability of containerized applications by providing insights into container performance, resource use, and application behavior. It also helps detect bottlenecks, identify optimization opportunities, and scale resources based on workload demand.

Recommendation: Opt for tools and platforms that collect data to automatically scale resources and move workloads, provide real-time insights into environment health and performance, and automatically alert administrators of potential issues.

4 Application availability

Maintaining high availability is an essential aspect of containerized environments. Containerized applications need to be accessible to users at all times, so containers must continue to run, even when problems occur in the underlying infrastructure.

Recommendation: Choose an application platform that performs automatic, customizable health checks, ensures redundancy and fault tolerance across nodes, and follows user-defined failover processes when issues occur.

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- ▶ [Build containerized applications](#) with Red Hat OpenShift.

5 Maintenance and management

Container hosts require reliable network connectivity, sufficient storage capacity, and a properly tuned operating system. Regular infrastructure maintenance and management—including updates and patches—ensure the reliability and performance of your container environment.

Security response is also crucial in containerized environments. Preventing, identifying, and addressing potential security vulnerabilities helps protect the integrity of containerized applications and infrastructure and avoid unexpected outages.

Recommendation: Find platforms that are backed by experienced incident response teams, can automatically balance resources, and can manage and upgrade the underlying operating system.

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2 IDC. "Worldwide Server Operating System Environments Market Shares, 2022: Steady Growth Persists." Document #US51038623, July 2023.

3 Gartner. "Magic Quadrant for DevOps Platforms," June 2023.

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