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Dell APEX Cloud Platform for Red Hat OpenShift

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Abstract: Application modernization, particularly through containerization, is fueling a need for infrastructure modernization overall. That modernization work needs to take place everywhere to deliver consistency and easy portability across the full environment. Dell and Red Hat, which have been looking into ways to help their customers modernize and increase the benefits associated with application modernization efforts, have recently released a transformative joint solution called APEX Cloud Platform for Red Hat OpenShift.

Introduction

Thanks in large part to the rise in container adoption, the importance of creating consistency across environments to better support application portability has increased as well. Currently, 67% of organizations surveyed by TechTarget's Enterprise Strategy Group are using containers for their production applications, and an additional 18% expect to adopt containers in the next 12 months.[1]

When Enterprise Strategy Group asked those organizations what benefits they hope to attain from using containers, the most common response was improved productivity (cited by 54%).[2] Basically, businesses are adopting containers to improve the quality and speed of their application development initiatives, and container portability is essential to that effort. Research showed that 87% of organizations consider application portability to be either critical to their organization (cited by 20%) or very important (cited by 67%).[3]

Because of this widespread desire for application and data portability, organizations are realizing that they must deploy container-based solutions everywhere—both on and off premises—with consistent technology. In this manner, they will ultimately simplify IT operations as a whole.

APEX Cloud Platform for Red Hat OpenShift could be the way to achieve this goal. This solution, which is jointly engineered by Dell and Red Hat:

- Delivers a simple solution to deploy and operate Red Hat OpenShift Kubernetes container platform on bare-metal infrastructure with 4th Gen Intel® Xeon® Scalable processors for on-premises deployments.

- Transforms OpenShift deployments with extensive, full-stack automation for initial deployments, ongoing operations, and lifecycle management through a native OpenShift interface.

- Leverages Dell's enterprise software-defined storage and universal storage layer to deliver enterprise storage capabilities and simplify data movement across hybrid cloud environments.

- Offers a Dell Validated Design to accelerate time to value for generative AI initiatives with Red Hat OpenShift AI.

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[1] Source: Enterprise Strategy Group Complete Survey Results, *Distributed Cloud Series: The State of Infrastructure Modernization Across the Distributed Cloud*, August 2023.
[2] Ibid.
[3] Source: Enterprise Strategy Group Complete Survey Results, *Distributed Cloud Series: The Mainstreaming of Cloud-native Apps and Methodologies*, May 2023.
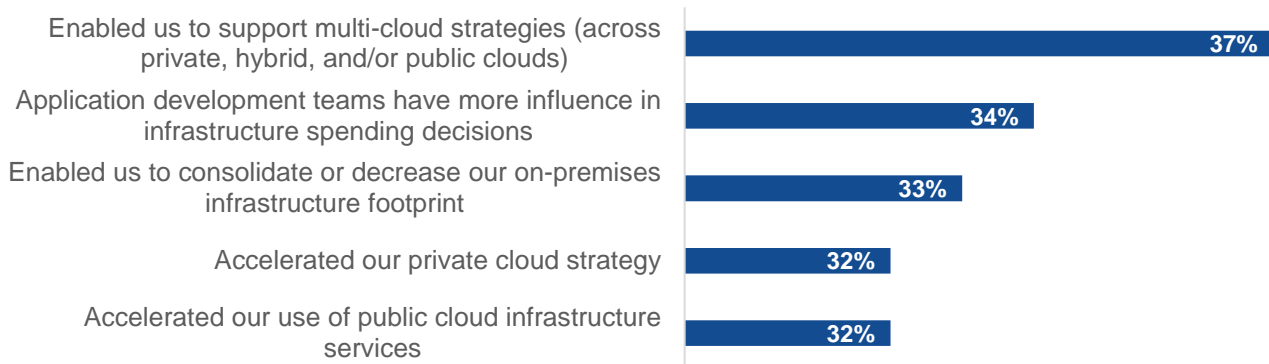
Enterprise Strategy Group
by TechTarget

The Need to Simplify On-premises Infrastructure for Containers to Better Serve Application Modernization

Enterprise Strategy Group research highlighted why it is so important to modernize infrastructure to support the containerization of applications. Fifty-three percent of organizations surveyed are now deploying cloud-native applications either across multi-cloud environments (i.e., through a combination of private data center and public cloud environments, 42%) or exclusively in on-premises data center/colocation environments (11%).[4] In other words, many container-based environments need to take on-premises deployments into account.

The impact of containers on an IT architecture can be considerable. As Figure 1 shows, containers can enable an organization to better support hybrid, multi-cloud strategies; accelerate a private cloud strategy; and make it easier to provision infrastructure resources.[5]

Figure 1. Top 5 Impacts of Container Technology on Infrastructure Strategy

What impact has the usage of container technology had, or do you expect it to have, on your organization's overall infrastructure strategy? (Percent of respondents, N=358, multiple responses accepted)

Enabled us to support multi-cloud strategies (across private, hybrid, and/or public clouds)	37%
Application development teams have more influence in infrastructure spending decisions	34%
Enabled us to consolidate or decrease our on-premises infrastructure footprint	33%
Accelerated our private cloud strategy	32%
Accelerated our use of public cloud infrastructure services	32%

Source: Enterprise Strategy Group, a division of TechTarget, Inc.

But every IT modernization project comes with challenges. When it comes to challenges specific to supporting container or microservices-based architectures, ensuring integration with the infrastructure appears to be the most common issue (cited by 36% of respondents).[6]

Beyond needing to support the containerized applications themselves, organizations also need to devote extra attention to accelerating emerging workloads—particularly AI and generative AI (GenAI)—to ensure that the business can keep pace with competition. Notably, only 15% of organizations surveyed by Enterprise Strategy Group have no plans to adopt GenAI.[7]

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[4] Source: Enterprise Strategy Group Complete Survey Results, *Distributed Cloud Series: The Mainstreaming of Cloud-native Apps and Methodologies,* May 2023.

[5] Source: Enterprise Strategy Group Complete Survey Results, *Distributed Cloud Series: The State of Infrastructure Modernization Across the Distributed Cloud*, August 2023.

[6] Source: Enterprise Strategy Group Complete Survey Results, *Distributed Cloud Series: The Mainstreaming of Cloud-native Apps and Methodologies,* May 2023.

[7] Source: Enterprise Strategy Group Complete Survey Results, *Beyond the GenAI Hype: Real-world Investments, Use Cases, and Concerns*, August 2023.

APEX Cloud Platform for Red Hat OpenShift

This platform is a turnkey infrastructure—a complete application delivery platform, jointly engineered with Red Hat to transform OpenShift on premises. It combines everything needed to build, deploy, and operate modern apps: compute, storage, container orchestration, and full-stack management through a single pane of glass. This is important because, usually, consideration is only given to compute resources. Storage can be an afterthought, one that can then complicate the deployment, management, and operation of the stack required to support application environments. Now, Dell and Red Hat are delivering everything needed in one cohesive, centrally managed package.

Built on the Red Hat Enterprise Linux Core OS operating system and Kubernetes, Red Hat OpenShift is a market-leading enterprise-ready application platform designed to simplify the management and orchestration of container-based application environments. As a result, it also helps improve support for cloud-native development environments.

APEX Cloud Platform for Red Hat includes:

- Dell infrastructure nodes (MC nodes) that provide compute and storage resources. These are based on Dell's latest-generation PowerEdge servers that utilize 4th Gen Intel® Xeon® Scalable processors, which offer adaptive performance capabilities and advanced matrix extensions that lower the barriers for leveraging AI.

- Dell software-defined storage provides scalable, high-performance enterprise storage resources to deliver on wide range of workload requirements.

- APEX Cloud Platform Foundation Software management and operational capabilities for the entire stack, from initial deployments to ongoing operations and full-stack lifecycle management.

- Red Hat OpenShift Platform Plus, an enterprise Kubernetes platform that includes multi-cluster management, Kubernetes-native security, and a scalable registry.

The benefits that organizations can expect to experience from using APEX Cloud Platform for Red Hat OpenShift include:

- **Simplified hybrid cloud operations** by having an easier way to deploy and operate Red Hat OpenShift and Kubernetes on premises and on bare metal with a tested, validated configuration.

- **Accelerated application delivery** with a consistent container environment everywhere because Red Hat OpenShift can run in the cloud as well as on the Dell APEX solution. IT operations teams can thus standardize on the tools they use as well as the expertise they need to keep things running.

- **Better optimized workload placement and migration**, as having a consistent experience with the universal storage layer gives organizations greater agility to move workloads to the right location for their needs.

- **An enhanced ability to support and enable emerging workloads such as AI and GenAI**, making it easier to respond to competitive pressures by accelerating the adoption of emerging-technology-based applications.

Dell Validated Design for Red Hat OpenShift AI on APEX Cloud Platform

The Dell Validated Design for Red Hat OpenShift AI on Dell APEX Cloud Platform can accelerate deployment time and reduce risk (see Figure 2). It is designed to offer capacity scalability to support growing data environments and offers an option to include NVIDIA A2, A16, A30, and A40 GPU configurations.

The Dell Validated Design for Red Hat OpenShift AI on APEX Cloud Platform offers organizations a simple guide on how to deploy a digital assistant utilizing a Large Language Model (LLM) and the Retrieval Augmented Generation (RAG) framework. This integrated multicloud solution illustrates using GenAI with your own data securely on-prem. Digital assistants are one of the most prominent use cases across industries, and implementing an LLM with RAG improves the quality of the information and keeps it current.

Figure 2. Dell Validated Design for Red Hat OpenShift AI on APEX Cloud Platform
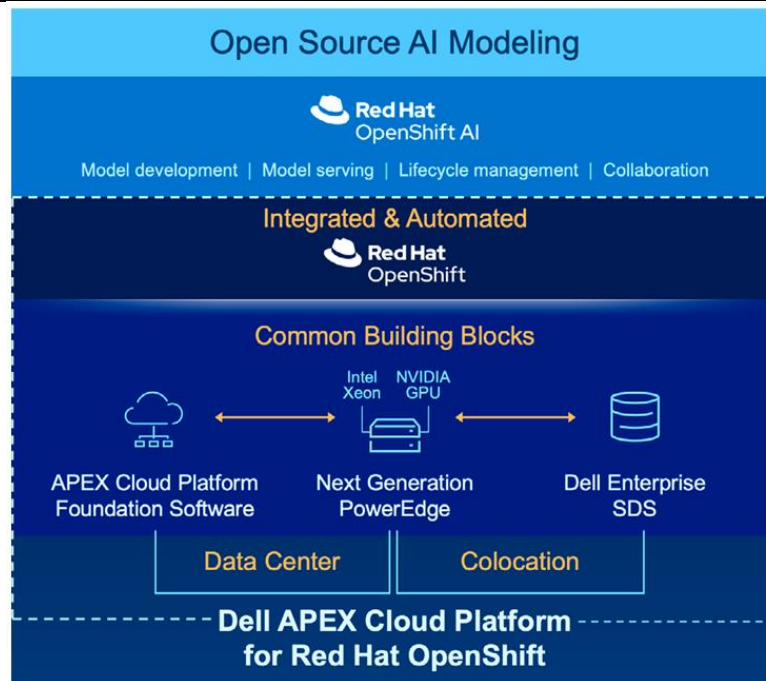
Source: Dell Technologies

Conclusion

Historically, Kubernetes containers have been regarded as incredibly useful but sometimes difficult to deploy and manage. Dell and Red Hat have jointly engineered this platform to address that issue. Dell conducted side-by-side internal tests deploying Red Hat OpenShift manually in a bare metal configuration versus deploying it using APEX Cloud Platform with its wizard-based automated deployment process and saw a 90% improvement over deploying OpenShift on bare metal in a manual approach. Enterprise Strategy Group has not independently validated those findings, but they certainly would represent a serious improvement in terms of time to value.

Granted, most organizations want bare metal for its benefits tied to cost, performance, and security. But it can be incredibly complex. Dell and Red Hat have solved that problem. In real-world terms, this level of simplification means that organizations will now find it both faster and much easier to create revenue-generating applications and deploy them across hybrid environments—including the newest applications that are centered on GenAI.

And perhaps the most noteworthy advancement reflected in this solution is the provenance of the storage. This jointly engineered offering leverages a Dell software-defined, *universal* storage layer. It really is the key to simplifying application and data portability in a hybrid context so that organizations can move their applications to where they need to be.

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