

Power your hybrid cloud with Red Hat OpenShift and FlashStack



Deploy modern hybrid cloud infrastructure

Red Hat, Cisco, and Pure Storage offer a modular, validated hybrid cloud solution.

- ▶ Simplify application deployment and management.
- ▶ Safeguard assets with a layered security approach.
- ▶ Reduce energy consumption and meet sustainability goals.

Achieve greater IT efficiency

Modern businesses rely on cloud technologies to deliver innovative new products and services. With an optimized mix of on-site and cloud infrastructure, hybrid cloud strategies help organizations increase agility and respond quickly to rapidly changing market conditions. These strategies are delivering results and 70% of digital leaders view cloud technologies as one of their two best-performing investments over the past 3 years.¹

Across industries, hybrid cloud environments provide IT organizations with new opportunities to develop and deploy applications and workloads with greater efficiency. Public cloud resources help meet short-term increases in user demand. Multiple datacenters in different geographies and managed by separate teams boost service availability and reliability. Development environments deployed on demand – using either private or public cloud resources – speed innovation. And a range of different infrastructure choices helps organizations meet business and technical requirements for budget, performance, compliance, and security. In fact, workloads today are nearly evenly distributed between on-site and public cloud infrastructure, with 51% of workloads running in private datacenters and 49% in hosted or cloud environments on average.²

Even so, executing hybrid cloud strategies across complex IT environments can be difficult and time consuming. Diverse application architectures, highly distributed infrastructure, and concerns around data protection, backup, and disaster recovery pose significant challenges to achieving a consistent, efficient IT environment. As industry leaders and experts, Red Hat, Cisco, and Pure Storage offer flexible hybrid cloud architectures that provide a foundation for modern application workloads. We work together to incorporate the latest features and capabilities, validate integrations, and create reference architectures to help you keep pace with changing technologies and approaches. Our production-ready, security-focused solutions help you develop applications faster and respond to evolving business needs. With integrations that span public clouds, private datacenters, and edge infrastructure, our architectures allow you to quickly and consistently deploy innovative, cloud-native workloads anywhere.

The [FlashStack for Cloud Native with Cisco Intersight, Red Hat® OpenShift®, and Portworx Enterprise Design](#) incorporates best practices for compute, storage, and network design in a validated, scalable, ready-to-deploy solution. Develop modern applications and services on a flexible, modular architecture optimized for artificial intelligence and machine learning (AI/ML) and fast data access. Deploy

¹ Nash Squared. "[Nash Squared Digital Leadership Report 2023](#)," November 2023.

² Cisco. "[The Cisco 2023 Global Networking Trends Report](#)," February 2023.



Take advantage of industry leadership

As industry leaders and experts, we bring innovative, tested, and integrated joint solutions to market, saving your organization time and money. We work together to incorporate the latest features and capabilities, validate integrations, update solutions and reference architectures, and train support engineers to help your teams keep pace with changing technology and approaches.

cloud-native and traditional applications in containers using on-site or public cloud resources. Then monitor and manage your entire hybrid cloud environment – including scaling, backups, replication, and disaster recovery – with a modern, future-ready solution.

Simplify hybrid cloud deployments

The integrated, validated joint solution from Red Hat, Cisco, and Pure Storage provides a consistent, cloud-native experience that simplifies hybrid cloud operations and lets you focus on innovation and business value. Based on a flexible, modular, highly available architecture, the solution reduces datacenter complexity and aligns with Red Hat, Cisco, and Pure Storage best practices. Jointly supported by Cisco and Pure Storage, [FlashStack](#) delivers enterprise-grade software-defined compute, storage, and server networking for on-site datacenters. [Red Hat Enterprise Linux®](#) and [Red Hat OpenShift](#) provide the software foundation – including the operating system and application platform – for deploying cloud-native, container-based applications across FlashStack and other hybrid cloud resources.

With a cloud-ready design and automated life cycle management features, the solution streamlines installation, administration, and updates across the application platform, container host, Kubernetes clusters, and application services. Self-service capabilities let you build, run, and update containerized applications rapidly and with increased quality. Embedded security throughout the hardware and software helps protect data and applications and reduces the risk of security vulnerabilities. Optimized power and heat management lowers costs and supports corporate sustainability goals. And a cooperative support model with Cisco Solution Support ensures issues are resolved quickly.

FlashStack for Cloud Native with Cisco Intersight, Red Hat OpenShift, and Portworx Enterprise Design provides a complete solution architecture, including:

- ▶ [Cisco Unified Computing System™ \(Cisco UCS®\) X-Series Modular System](#).
- ▶ [Cisco Nexus® 9000 Series](#) and [Cisco MDS](#) switches.
- ▶ [Cisco UCS 6000 Series Fabric Interconnects](#).
- ▶ [Cisco Intersight®](#) cloud operations platform.
- ▶ [Pure Storage FlashArray//XL170](#).
- ▶ [Portworx by Pure Storage](#).
- ▶ [Red Hat OpenShift Container Platform](#).
- ▶ [Red Hat Hybrid Cloud Console](#).
- ▶ [Red Hat Advanced Cluster Management for Kubernetes](#).
- ▶ [Red Hat OpenShift Service on AWS](#).
- ▶ [Red Hat Ansible® Automation Platform](#).

These components are integrated, validated, and automated wherever possible, allowing you to deploy the solution quickly and economically while eliminating many of the risks associated with researching, designing, building, and deploying similar solutions in-house.

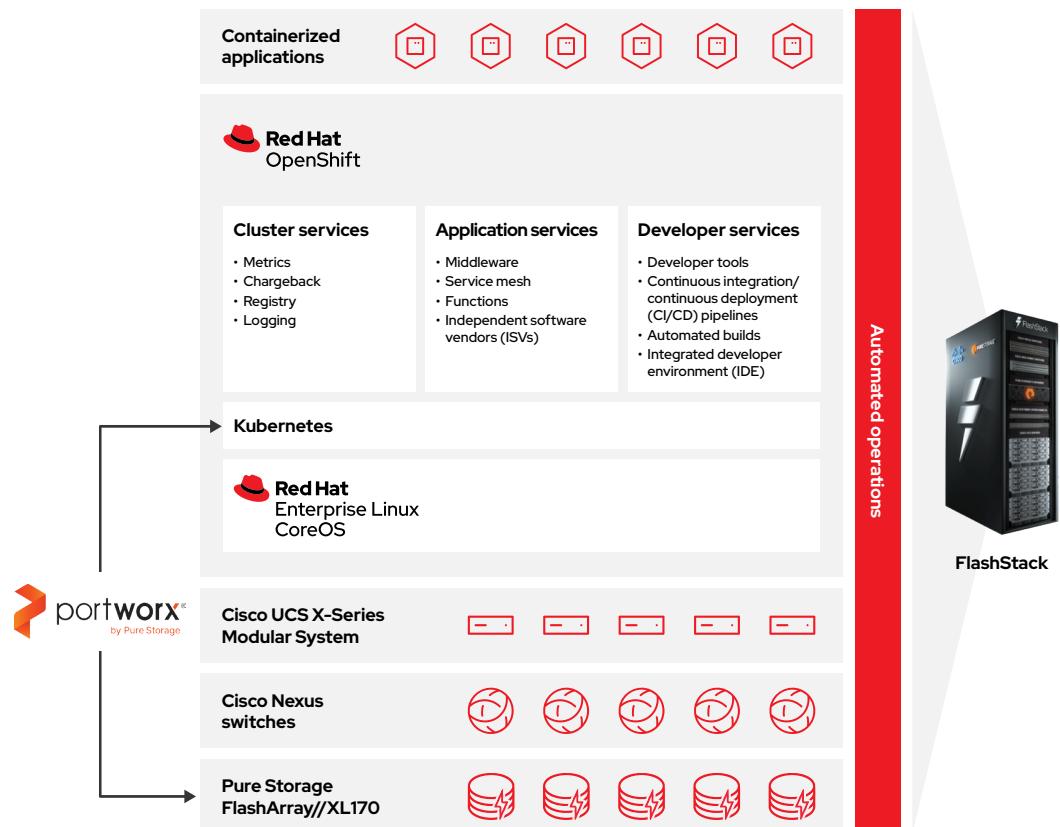


Figure 1. The FlashStack for Cloud Native with Cisco Intersight, Red Hat OpenShift, and Portworx Enterprise Design solution combines compute, networking, storage, containers, and management to support modern applications in hybrid cloud environments.

Each component provides key capabilities for the overall solution. For example, Cisco servers, switches, and networking deliver efficient, high-performance datacenter infrastructure. Cisco Intersight simplifies infrastructure configuration and visibility across cloud environments. Pure Storage FlashArray provides all-flash storage backed by an enterprise-class array with 99.9999% reliability, data-at-rest encryption, and advanced data reduction technology. Portworx by Pure Storage delivers persistent container storage – along with disaster recovery, data security, data migration, and capacity management features – for cloud-native workloads running across on-site datacenters and public cloud infrastructure.



Adopt new technologies with proven solutions

Cisco Validated Designs are validated, documented approaches that help you design, deploy, and extend new technologies across your environment. Use these guides to build network configurations, ensure new solutions fit into existing systems, and adopt best practices for successful deployments.

Learn more about [Cisco Validated Designs](#).

Red Hat OpenShift is a unified, enterprise-ready application platform that delivers full-stack automated operations to manage hybrid cloud deployments. Powered by containers, Kubernetes, and DevSecOps capabilities, it provides a foundation for rapidly building, deploying, running, and managing both existing and new applications at scale and with security across hybrid environments. Red Hat OpenShift empowers you to modernize, transform, and innovate to support business initiatives. It runs consistently across cloud environments, giving you the tools, services, and capabilities you need to be successful today and in the future. Integration with FlashStack simplifies infrastructure deployment and management and extends the benefits of automation to the entire stack.

Simplify hybrid cloud operations

53% of IT leaders are moving workloads between on-site and public cloud environments weekly.³ The joint solution from Red Hat, Cisco, and Pure Storage simplifies application migration, deployment, and management across hybrid cloud environments. As a Cisco Validated Design, the solution provides a tested architecture for standardized, repeatable deployments for modern, diverse use cases. Back up and recover data across public and private cloud environments; support multiple development, test, and production environments; and extend your datacenter with cloud bursting.

With a flexible, intelligent platform powered by AI-based tools, you can automate tasks and scale quickly to improve workload performance and reliability. Red Hat OpenShift – combined with Red Hat Ansible Automation Platform – lets you automatically manage collections of infrastructure faster and more efficiently. As the cloud-based management platform for Cisco UCS servers, Cisco Intersight provides stateless configuration management for server, network, and storage policies anywhere you need it, at any scale. The intelligent visualization, optimization, and orchestration capabilities of Cisco Intersight simplify and consolidate application and infrastructure management across your hybrid cloud environment.

Adopt defense-in-depth security

44% of IT leaders are deploying cloud-native technologies to improve security.³ To help you safeguard assets in your hybrid cloud environment, the Red Hat, Cisco, and Pure Storage solution includes features that support a layered security approach across operations.

The scalable, resilient solution architecture includes integrated node management and network segmentation to protect sensitive data in transit and at rest. Runtime behavioral analysis powered by ML technologies identifies patterns and classifies threats to help you discover and manage potential vulnerabilities. Automatic hybrid cloud infrastructure configuration using default and customizable security policies, access controls, and event responses helps defend against threats. Integrated back up and restore with up to 10-to-1 data reduction speeds disaster recovery across your hybrid cloud environment to minimize potential business disruptions. And with [SafeMode Snapshots](#), your data is protected in the event of theft. Finally, a DevSecOps framework helps developers increase application security throughout the entire application life cycle.

³ Cisco. ["2022 Global Hybrid Cloud Trends Report"](#) February 2023.



Meet datacenter sustainability goals

53% of organizations plan to achieve net-zero carbon footprints, with 36% looking to meet those goals by 2030.¹ Solutions from Red Hat, Cisco, and Pure Storage reduce the energy consumption and physical footprint of your datacenters, helping you lower costs and meet your corporate sustainability goals.

Designed to operate with greater energy efficiency at higher performance levels, Pure Storage FlashArray and Cisco UCS X-Series servers deliver increased storage and compute density. Always-on data reduction algorithms provide constant compression that reduces physical storage requirements and leads to smaller system sizes. Thermal-efficient designs – including monitoring and cooling algorithms that dynamically adjust power use for optimal efficiency – lower energy use while maximizing system performance. And with modular components, sustainable packaging, recycled materials, and [Pure Storage Evergreen](#) subscriptions, you can limit e-waste and reach your sustainability goals faster.

Automate your hybrid cloud with a GitOps approach

[Infrastructure-as-code \(IaC\)](#) approaches give organizations a simple, reliable, consistent way to provision, deploy, and manage their hybrid and multicloud infrastructure and applications. [GitOps](#) is an IaC approach that uses Git repositories as a single source of truth to ensure consistent, repeatable operations across environments, reducing the risk of configuration drift and errors. Storing versioned infrastructure definitions in Git repositories simplifies auditing and lets you quickly and easily revert to previous configurations in the event of an issue. Many common tasks like infrastructure provisioning and scaling can be automated using a GitOps approach, saving time and minimizing the risk of issues that are common with manual processes. And because GitOps records IT processes and configurations in a single, standardized format, development and operations teams can collaborate more effectively.

[FlashStack for Hybrid Multicloud GitOps](#) solution deploys the [Red Hat Validated Pattern for Multicloud GitOps](#) on Red Hat, Cisco, and Pure Storage infrastructure. The validated pattern details a GitOps approach for managing hybrid and multicloud deployments. The pattern uses the FlashStack for Cloud Native with Cisco Intersight, Red Hat OpenShift, and Portworx Enterprise Design solution to provide high performance, scalability, and reliability across hybrid cloud infrastructure. To complete the implementation, the pattern requires a management hub for IaC components and infrastructure extending to 1 or more managed clusters, including public cloud resources or on-site FlashStack systems.

The FlashStack for Hybrid Multicloud GitOps solution lets you realize all the benefits of a GitOps approach across your hybrid and multicloud environments. Unify management across on-site, public cloud, and edge resources to quickly scale applications and infrastructure based on current demand. Protect dynamic infrastructure tokens and credentials to minimize the risk of security incidents that impact critical business processes. And adopt best practices for continuous infrastructure delivery that help you respond quickly to rapidly changing market conditions.

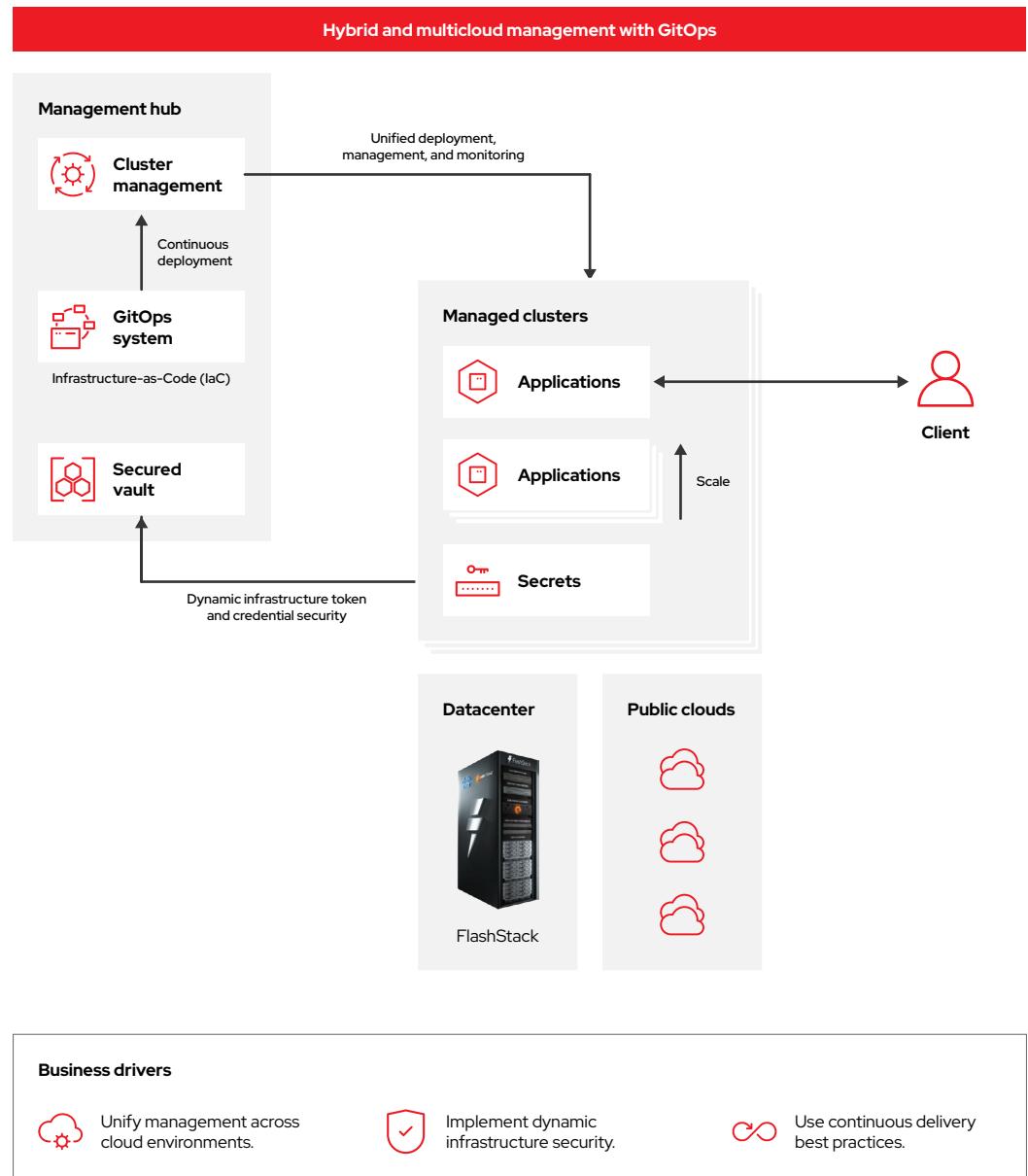


Figure 2. Use IaC approaches to manage hybrid and multicloud environments with the FlashStack for Hybrid Multicloud GitOps solution.

Create new solutions faster with Validated Patterns

Validated Patterns are an evolution in hybrid cloud application deployment. Using a pattern, you can automatically deploy a full application stack through a GitOps-based framework that lets you create business-centric solutions with a continuous integration approach.

Learn more about [Validated Patterns](#).

Key use cases across industries

You can deploy the FlashStack for Cloud Native with Cisco Intersight, Red Hat OpenShift, and Portworx Enterprise Design solution for a wide range of workloads and use cases across industries. Some examples of these use cases are shown in Table 1.

Table 1. Key use cases for the FlashStack for Cloud Native with Cisco Intersight, Red Hat OpenShift, and Portworx Enterprise Design solution

Industry	Use cases
Financial services	<ul style="list-style-type: none">▶ Detect fraud faster.▶ Enhance customer services.
Energy	<ul style="list-style-type: none">▶ Optimize field operations.▶ Improve worker safety.
Automotive	<ul style="list-style-type: none">▶ Create and deploy autonomous driving technologies.▶ Automate component testing.
Government and public sector	<ul style="list-style-type: none">▶ Improve information management.▶ Enhance critical decision support.
Healthcare	<ul style="list-style-type: none">▶ Increase clinic and hospital efficiency.▶ Improve diagnostics.▶ Store and protect sensitive medical records.
Telecommunications	<ul style="list-style-type: none">▶ Improve customer services.▶ Optimize network operations.
Manufacturing	<ul style="list-style-type: none">▶ Predict equipment failures.▶ Perform preventative maintenance.

Learn more

The FlashStack for Cloud Native with Cisco Intersight, Red Hat OpenShift, and Portworx Enterprise Design solution can help your organization deploy and manage modern hybrid cloud infrastructure at any scale.

Learn more about this solution and our partnerships:

- ▶ [FlashStack solutions](#)
- ▶ [FlashStack for Cloud Native with Cisco Intersight, Red Hat OpenShift, and Portworx Enterprise Design guide](#)
- ▶ [Red Hat and Cisco partnership](#)
- ▶ [Cisco and Red Hat partnership](#)
- ▶ [Red Hat and Pure Storage partnership](#)

About Red Hat



Red Hat is the world's leading provider of enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers develop cloud-native applications, integrate existing and new IT applications, and automate and manage complex environments. [A trusted adviser to the Fortune 500](#), Red Hat provides [award-winning](#) support, training, and consulting services that bring the benefits of open innovation to any industry. Red Hat is a connective hub in a global network of enterprises, partners, and communities, helping organizations grow, transform, and prepare for the digital future.