PURESTORAGE®

Red Hat

Pure Enhances OpenStack Deployments

Experience advanced storage features and increased performance for OpenStack environments.

OpenStack is a widely supported, open-source software used to build public and private clouds. An important part of successful Red Hat OpenStack implementations is storage integration. Traditional storage solutions can limit the benefits of OpenStack infrastructure due to a lack of integration and a reliance on multiple legacy tools, with each requiring separate login credentials. White-box storage nodes can be costly to maintain, slow, and extremely complex. Purpose-built storage arrays, even those using flash, can be expensive and difficult to scale, and they can disrupt cloud services during upgrades and maintenance.

Pure Storage® streamlines OpenStack deployments by simplifying integration, enhancing performance, and increasing storage efficiency on all-flash arrays. With sub-millisecond latencies at full speed and instant read/write availability, Pure Storage provides a fast, simple, and reliable solution for organizations deploying OpenStack.

Simple and Automated Configuration

OpenStack configuration on FlashArray™ products requires minimal effort compared to other vendors' solutions, which can require additional efforts such as pre-configuration of back-end arrays. With Pure, no pre-configuration is required. All Pure configuration is controlled by the Pure Storage Cinder driver for OpenStack. This integration with Cinder—the block-storage service for OpenStack—can save deployment and maintenance time; storage administrators aren't required to learn another tool or graphical user interface (GUI) or waste time setting up multiple back-end arrays. All storage activities can be done through the Red Hat OpenStack GUI, including:

- Creating and deleting volumes
- Attaching and detaching hosts
- Creating, deleting, and reverting snapshots

Simple, Automated Storage for OpenStack

Pure FlashArrays don't require pre-configuration of back-end arrays. All configuration is handled via the OpenStack GUI.

Always On

Pure FlashArray products provide 99.9999% availability, which helps keeps OpenStack running.

Efficient Storage

Pure FlashArray products use various compression and deduplication technologies to provide up to a 5:1 data reduction, 10:1 storage efficiency with thin provisioning.[1]

- Enabling full synchronous and asynchronous replication support

- Using OpenStack generic volume groups

- Creating per-volume native quality of service (QoS)

Orchestration

Pure Storage provides further OpenStack control with the Python automation toolkit. For organizations who want to automate control over their storage, this toolkit—available at no cost to all Pure Storage customers—provides access to common storage capabilities using Python, including:

- Automated snapshot policies

- Capacity management and monitoring

- Volume management

Organizations who want full customization control over their FlashArray solutions can make use of Pure's comprehensive RESTful API.

This API helps organizations develop custom solutions for managing their Pure Storage arrays using common programming languages, such as PowerShell and Python. Organizations can create custom tools that simplify orchestration and management tasks and streamline workflows. These benefits can help lower OpenStack operational costs while giving OpenStack administrators the tools they need to efficiently manage their deployments.

Efficient, Reliable Storage for OpenStack Deployments

As OpenStack implementations grow, managing storage can become more complex and expensive. Organizations have often relied on "white-box" direct-attached nodes to provide storage for their OpenStack deployments. Yet managing these nodes can be difficult, especially as the number of nodes grows into the dozens, hundreds, or more. White-box nodes are often costly to maintain, slow, and complex. Additionally, these nodes can suffer from reliability issues, might not provide data-reduction features that help reduce storage costs, and can drive up power costs.

Our customers tell us they can achieve extremely high levels of consolidation with a single FlashArray//X or //C product—in some cases up to 100-times reduction in white-box nodes. By consolidating data, organizations can realize the benefits of a simplified OpenStack data landscape that provides lower power and cooling costs and better management tools.[2]

Pure Storage provides data reduction that can save space by utilizing pattern removal, deduplication, inline compression, deep reduction, and copy reduction across the array. Combined, these data-reduction technologies can provide up to a 5:1 data reduction savings. Organizations can obtain further efficiencies using thin provisioning, which can provide storage efficiency rates of up to 10:1.[1]

Always On

OpenStack deployments of any size require reliable storage. The OpenStack Block Storage service (Cinder) provides block storage to virtual machines (VMs), hosts, and containers within the OpenStack ecosystem. If a storage device failure occurs, all OpenStack services that use the storage device are negatively impacted.
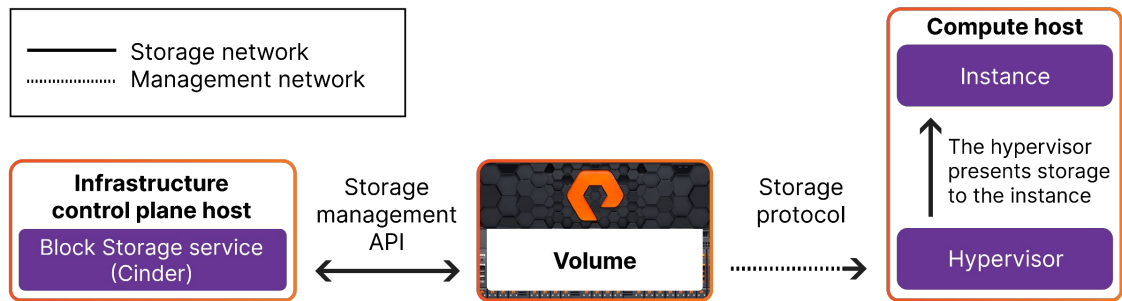
Figure 1: Pure Storage FlashArray integrates with the OpenStack Block Storage service (Cinder) to provide storage to OpenStack hypervisors and instances

FlashArray provides 99.9999% availability, which helps ensure OpenStack uptime.^{Error! Bookmark not defined.} FlashArray provides built-in redundancy, data protection, business continuity, and disaster-recovery capabilities that are all used by OpenStack. Additionally, the Purity ActiveCluster™ solution helps you maintain data replicas and snapshots within the same data center, or across multiple sites.

OpenStack deployments also benefit from Pure's Evergreen Storage™ business model, a non-disruptive upgrade approach that helps lower operational costs. Evergreen Storage lets you upgrade FlashArray in place, without costly downtime or migrations.

Pure's Continued Investment in OpenStack

Pure Storage continues to actively contribute to OpenStack community development with a dedicated OpenStack open-source development team. As an active contributor to multiple core projects, Pure's contributions include:

- More than 1,000 code and patch-set commits
- More than 50,000 lines of code, with 22,200 in Cinder alone
- High-level architectural designs
- Certifying the Red Hat driver for the entire OpenStack platform integration
- Certified Cinder containers for use with Red Hat OpenStack Platform.

Pure also contributes to several OpenStack projects that integrate with Pure, as shown in Table 1.

OpenStack project name	Function
Glance	Image service
Swift	Object storage
Cinder	Block storage
Nova	Compute

Table 1: Pure Storage solution integration with OpenStack projects

Learn How Pure Storage Can Enhance OpenStack Deployments

With years of collaboration on OpenStack projects and complete integration with Cinder, Pure Storage provides a simple, robust, reliable storage solution for OpenStack deployments. Pure also publicly shares all of its OpenStack reference documentation, including best practices, tips, hints, integration points, and group discussions.

Additional Resources

- Learn more about Pure and OpenStack.

- Redefine how you can handle data with FlashArray//C, FlashArray//X, and FlashArray//XL.

- Discover how Evergreen Storage delivers real IT agility.

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[1] Pure Storage. "Pure Storage FlashArray//X." 2021. Available at: www.purestorage.com/content/dam/pdf/en/datasheets/ds-flasharray-x.pdf.

[2] Wattage depends on configuration and can range from 640 watts for a 3U FlashArray//X10 without additional shelves to 1,446 watts for a 3U to 6U configuration for a FlashArray//X90 without additional shelves.