SOLUTION BRIEF

Enhancing OpenStack Deployments with Pure Storage

Performance, simplicity, and advanced storage features for OpenStack environments

OpenStack is open-source software widely used for building public and private clouds. Pure Storage® streamlines OpenStack deployments by simplifying integration, enhancing performance, and increasing storage efficiency on all-flash arrays. With sub-millisecond latencies 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 may need additional work such as pre-configuration of back-end arrays. With Pure Storage, no pre-configuration is necessary.

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. It supports both iSCSI, Fibre Channel SANs, and NVMe-RoCE via OpenStack Zed. All storage activities can be done through the OpenStack GUI, including:

- Creating and deleting volumes
- Attaching and detaching hosts
- Creating, deleting, and reverting snapshots
- Enabling full synchronous and asynchronous replication support
- Using OpenStack generic volume groups
- Creating per-volume native quality of service (QoS)

Your Choice of Distribution

Pure is certified with Red Hat OpenStack and has multiple integrations with Canonical OpenStack.

Fast Matters

FlashArray accelerates critical OpenStack workloads with robust performance, minimal latency, and proven resiliency.

Greener Storage

Pure is a leader in high-density, energy efficient data storage, helping organizations meet decarbonization and sustainability goals.

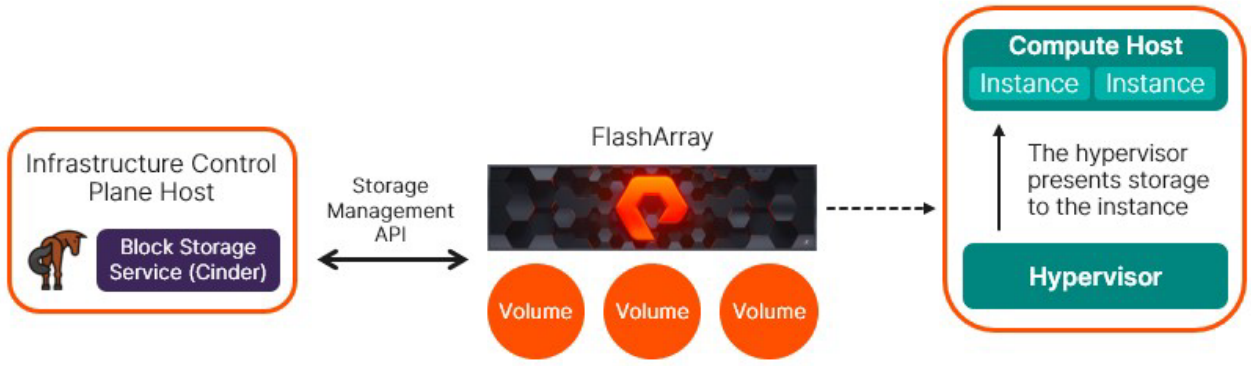

Figure 1: Pure Storage FlashArray integrates with the OpenStack Block Storage service (Cinder) to provide storage to OpenStack hypervisors and instances

Orchestration

Pure Storage provides further OpenStack control with the Python automation toolkit. For organizations that want to automate control over their storage, this toolkit—available to all Pure Storage customers via our developer community site—provides access to common storage capabilities using Python, including:

- Automated snapshot policies
- Capacity management and monitoring
- Volume management

Organizations that want full customization control over their FlashArray solutions can make use of a comprehensive RESTful API from Pure Storage. 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 commonly rely 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, as well as 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.

Pure Storage uncomplicates your storage environment. The hardware, software, and cloud management experience are co-designed to make everything just work. Systems never require performance tuning, and all array software is included. Pure is the ideal solution for a limited IT staff that wants to spend less time keeping things running and more time innovating.

For the ultimate in performance and array density, FlashArray//XL™ allows you to consolidate more business services—bigger databases, more users, and more app workloads—on fewer arrays. For high performance workloads that don't need the

density of FlashArray//XL, the FlashArray//X™ family delivers consistent low latency across a range of size and performance options. Always-on Quality of Service (QoS) provides IOPs and bandwidth limits to ensure applications get the resources they need.

For less demanding workloads and those that are capacity oriented, FlashArray//C™ lets you consolidate workloads with consistent all-flash performance at a lower TCO than hybrid storage. FlashArray//C provides a 100% NVMe, all-flash experience for capacity-oriented applications, test, and development work, multi-site disaster recovery, and data protection. FlashArray//C can also act as a target for Cinder NFS backups.

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.

FlashArray provides 99.9999% availability, a number that includes expansions and controller upgrades. Many Pure customers have never had a moment of array downtime. 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 sites.

High Density, Low-power Storage

Organizations across all industries are concerned with increasing power consumption in their data centers. Pure Storage has the most power-efficient storage systems in the industry. Optimized for performance and efficiency, Pure Storage utilizes up to 80% less energy than competitive all-flash arrays while using 96% less space than hybrid disk storage.

Pure Storage Helps OpenStack Users in Multiple Industries

Telecom: Pure helps Service Providers deploy OpenStack to meet current and future use cases, including next generation 5G core networks, OpenRAN, VNF, CNF, AI at the edge, and more.

Automotive: Pure helps auto manufacturers deliver on autonomous driving, customer experience, digital twins, and the promises of Industry 4.0.

Financial services: Pure helps financial services organizations with private and hybrid-cloud implementations, IT operations automation, and a cloud-native approach to application development and deployment

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, our 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
- Certified JuJu Charm for Canonical OpenStack
- Certified Cinder containers for use with Red Hat OpenStack Platform
- Fully integrated driver with IBM PowerVC
- Full Ansible-Kolla deployment integration

Pure contributes to multiple OpenStack projects, including those shown in the following table.

OpenStack Project Name	Function
Cinder	Block storage
Glance	Image Service
Nova	Compute
Manila	File Service

Pure Storage Enhances 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 its OpenStack reference documentation, including best practices, tips, hints, integration points, and group discussions.

Additional Resources

- Explore best practices, release notes and more for OpenStack

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