RED HAT®
STORAGE

redhat.

COMPLETE OPENSTACK STORAGE FROM RED HAT

TECHNOLOGY OVERVIEW

INTRODUCTION

OpenStack® is the largest and fastest-growing open source cloud infrastructure project. Built by a broad community of contributors, OpenStack helps enterprises build and manage scalable, flexible services. But to achieve this, it must be supported by storage that is equally open, flexible, and scalable on standard hardware.

Red Hat® Ceph® Storage is a software-defined storage platform that integrates more tightly with OpenStack than any other storage offering, including traditional, proprietary storage solutions. It is engineered for modern workloads like cloud infrastructure, making Red Hat OpenStack Platform and Red Hat Ceph Storage an ideal combination for organizations seeking the benefits of an OpenStack cloud environment.

ENTERPRISE-READY OPEN SOURCE TECHNOLOGY

Storage administrators and cloud practitioners are under growing pressure to attain greater cost efficiencies with the technologies they deploy. They need to control data growth with architectures that can handle multiple workloads, since versatility translates into economies of scale. Often they suffer from the labor constraints of proprietary solutions and increasingly complex architectures that are difficult to maintain. They know that their IT infrastructure is demanding storage that is enterprise ready, with levels of resilience, performance, and data protection that are consistent with wide-scale deployment. Also, they require an agile infrastructure that can map to the capabilities of cloud services and support a transition into a software-defined datacenter.

These are some of the reasons behind the growing popularity of OpenStack and Ceph Storage. However, successful deployment of OpenStack and Ceph solutions often depends on partnering with a vendor that has a history of open source expertise, a solid allegiance to the OpenStack and Ceph communities, and differentiated services and support expertise.

An OpenStack Foundation platinum member and top code contributor to both OpenStack and Ceph communities, Red Hat has helped numerous customers around the world achieve digital transformation through the successful deployment and management of OpenStack-based clouds. This success is complemented by the continued availability of global consulting experts and a broad certified partner ecosystem.

RED HAT APPROACH

RED HAT CEPH STORAGE

Red Hat Ceph Storage offers a single efficient platform to support block storage—both persistent and ephemeral—object storage, and file storage. Red Hat Ceph Storage provides:

- Massive scalability, great flexibility, and cost-effective deployment.
- Tight integration with OpenStack component services, architecture, and cloud scale-out model.
- Support for Red Hat OpenStack Platform and Ubuntu OpenStack.

Red Hat Ceph Storage scales as OpenStack scales: quickly, reliably, and cost-effectively, on industry-standard servers and disks. It also maps to OpenStack's modular architecture and components for secure storage of petabytes of data. The Ceph Block Device (RBD) provides a single back end for OpenStack's Nova, Glance, and Cinder services to efficiently store images, volumes, and snapshots. The CephFS filesystem provides the underlying support for the Manila file sharing service, while the Ceph Object Gateway (RGW) provides a REST interface that is compatible with applications written for OpenStack Swift and supports the Keystone authentication service. RBD, CephFS, and RGW are all served by a the same storage cluster, capable of supporting all OpenStack services.

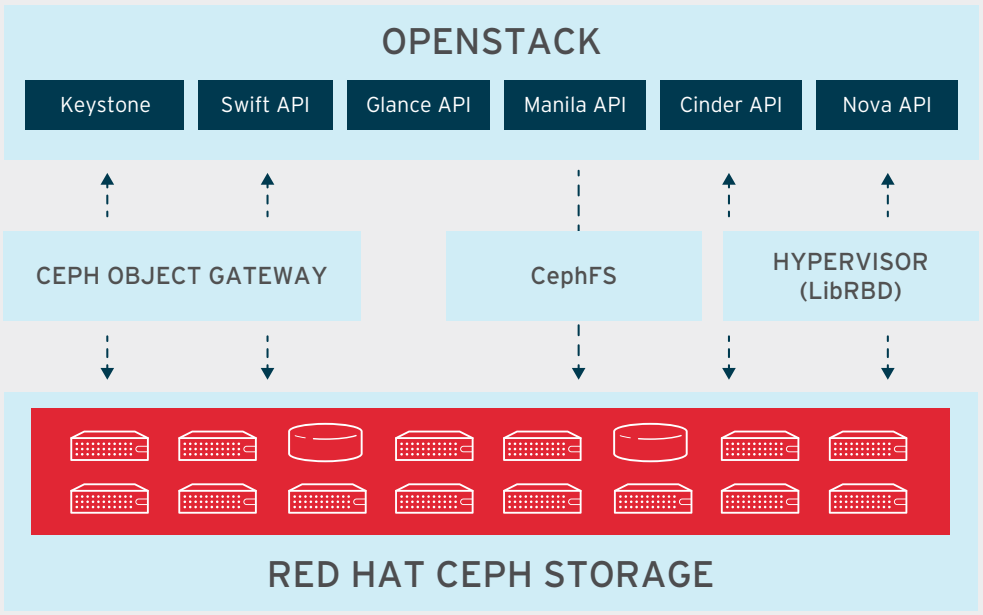


Figure 1. Red Hat Ceph Storage architecture

Thanks to Red Hat Ceph Storage, OpenStack users can boot up one or hundreds of virtual machines instantaneously, which are then readily accessible by cloud users. Backups are also instantaneous, thanks to seamless integration between Ceph and the Glance, Cinder, and Nova services. Red Hat Ceph Storage also supports different storage tiers to optimize costs and performance ratios for different workloads on the same cluster, as well as multisite replication for disaster recovery or archiving.

Red Hat Ceph Storage is also integrated with the OpenStack director tool for hyperconverged deployment and upgrade of storage and compute on the same hardware. Additional efficiencies can result from the ability to deploy Ceph in a containerized format, particularly for customers with massive scale installations on the edge and for whom rapid pace and disaggregated rollouts are critical. Red Hat Ceph Storage users can perform installations, upgrades, and updates atomically, resulting in reduced complexity, easier management, and faster deployment.

Containerization supports customers who are looking to standardize orchestration and deployment of infrastructure software in containers. Complex architectures like OpenStack can be deployed more easily by containerizing individual services. Containerized storage daemons in Red Hat Ceph Storage allow users to colocate services on the same machine without worrying about resource conflicts. This drives significantly better hardware utilization and lower costs while ensuring that daemons do not starve each other of resources in peak load and recovery situations, something that used to be addressed at higher cost by isolating these services on dedicated hardware.

RED HAT OPENSTACK PLATFORM

Red Hat OpenStack Platform is a production-ready, co-engineered cloud platform that combines a leading OpenStack technology with a trusted enterprise Linux® operating system to help enterprises address customer demands quickly, without sacrificing security or performance.[1]

Because OpenStack depends on its underlying Linux operating system for everything from service operation and access to hardware resources, system performance, driver integration, and data security, tight integration of OpenStack and its underlying Linux platform is critical to a stable, high-performing cloud.[2] Red Hat OpenStack Platform enhances the community version of OpenStack with advanced features needed for cloud environments to deliver the core Infrastructure-as-a-Service (IaaS) and secondary infrastructure needed for private or public clouds.

RED HAT HYPERCONVERGED INFRASTRUCTURE FOR CLOUD

Customers seeking an out-of-the-box hyperconverged solution can employ Red Hat Hyperconverged Infrastructure for Cloud. It combines Red Hat OpenStack Platform and Red Hat Ceph Storage in a single SKU, supported under a single, common life cycle, with a single, prescriptive installation experience based on Red Hat OpenStack Platform director.

Red Hat Hyperconverged Infrastructure for Cloud introduces a smaller footprint in which six nodes rather than nine are required for high availability of Ceph Storage and OpenStack Platform. The six nodes include three controllers/monitors and three hyperconverged compute/object storage daemon (OSD) nodes. In addition to a decreased configuration footprint, hardware can now be standardized without proprietary lock, opening up the possibility of discounts for more of the same server type, simplified operations from fewer server types, and more efficient use of hardware resources.

1 *http://www.redhat.com/en/technologies/linux-platforms/articles/engineered-for-enterprise*

2 *http://www.redhat.com/en/technologies/linux-platforms/articles/critical-bug-fix-example*

RED HAT CLOUD INFRASTRUCTURE AND RED HAT CLOUD SUITE

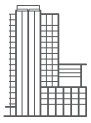
Red Hat Cloud Infrastructure tightly integrates Red Hat OpenStack Platform with Red Hat Virtualization, Red Hat CloudForms for cloud management, and Red Hat Satellite for life-cycle management—to help businesses successfully build and manage an open, private IaaS cloud.

Red Hat Cloud Suite offers the solutions included in Red Hat Cloud Infrastructure with the addition of Red Hat OpenShift Container Platform, a container-based application development platform.

THE RED HAT ADVANTAGE

Companies are struggling to keep up with the rapidly increasing growth of data and cloud computing environments. With years of enterprise customer experience, Red Hat combines its expertise as the leading Ceph authority[3] with the thriving innovation of the OpenStack, Ceph, and Linux communities, to provide an end-to-end, fully integrated set of solutions that is not only agile and reliable, but also cost-effective. To this, Red Hat adds the production-level support, product and resource access, life-cycle management, training, consulting services, and security to help customers deploy successfully over the long term.

3 Bitergia analytics shows that Red Hat provides the most Ceph bug fixes and code contributions by a factor of nearly 10 to 1. metrics.ceph.com



ABOUT RED HAT

Red Hat is the world's leading provider of open source software solutions, using a community-powered approach to provide reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.

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