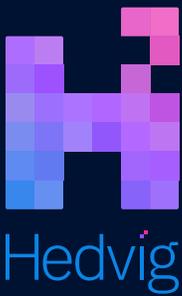




OPENSTACK TOOL KIT

*OpenStack Production Jitters?
We got you covered.*

Version 2.0
May 2018



Getting Started with OpenStack

“OpenStack software controls large pools of compute, storage, and networking resources throughout a datacenter, managed through a dashboard or via the OpenStack API. OpenStack works with popular enterprise and open source technologies making it ideal for heterogeneous infrastructure.”

KEY COMPONENTS of OpenStack

- > Nova: “the primary computing engine behind OpenStack”
- > Swift: “a storage system for objects and files”
- > Cinder: “a block storage component, which is more analogous to the traditional notion of a computer being able to access specific locations on a disk drive”
- > Neutron: “provides the networking capability of OpenStack”
- > Horizon: “the dashboard behind OpenStack; it is the only graphical interface to OpenStack”
- > Keystone: “provides identity services for OpenStack”
- > Glance: “provides image services to OpenStack”
- > Ceilometer: “provides telemetry services, which allow the cloud to provide billing services to individual users of the cloud”
- > Heat: “the orchestration component of OpenStack, which allows developers to store the requirements of a cloud application in a file that defines what resources are necessary for that application”

bit.ly/openstack-components

Brands Relying on OpenStack

- > Cigna
- > Wells Fargo
- > Best Buy
- > BBVA

Biggest OpenStack Contributors

- > Rackspace
- > IBM
- > Canonical
- > Metacloud
- > Red Hat
- > Cisco
- > SUSE
- > Piston Cloud
- > Dell
- > Mirantis
- > Nebula
- > Computing Co.
- > HP
- > Cloudscaling
- > VMware
- > VMware
- > Metacloud

Cloud Deployment Tools

Fuel

“Fuel is an open source deployment and management tool for OpenStack. Developed as an OpenStack community effort, it provides an intuitive, GUI-driven experience for deployment and management of OpenStack, related community projects and plug-ins.” [Click here for more details](#)

TripleO

“TripleO is a program aimed at installing, upgrading and operating OpenStack clouds using OpenStack’s own cloud facilities as the foundations – building on Nova, Neutron and Heat to automate fleet management at datacenter scale (and scaling down to as few as 2 machines).” [Click here for more details](#)

Compass

“Compass is an open source project that provides automated deployment and management of OpenStack.” [Click here for more details](#)

See a list of additional deployment tools



SCALE

Scalable storage for private and public clouds

Scale to petabytes of data. Start with as few as three nodes and scale to thousands. Add capacity when needed. Embrace the economics of commodity infrastructure for your storage.



BLOCK

Block, file and object storage: no-compromise

Define and deliver any type storage for your business applications running on any platform. Maximum flexibility means no compromise delivery of services to your business.



INTEGRATION

Seamless integration and automation

Cinder and Swift integration simplify storage provisioning directly from Openstack. Streamline deployment with support for Mirantis using the Hedvig Fuel Plugin.

Modern Storage for OpenStack

Automation, elasticity, and flexibility for cloud builders

Today's enterprises need to move faster to capitalize on new opportunities and need a greater level of agility in provisioning applications and infrastructure. OpenStack provides a comprehensive set of software tools for building and orchestrating private and public clouds, helping organizations achieve a faster time-to-market with infrastructure-as-a-service automation. The Hedvig Distributed Storage Platform designed with modern distributed systems DNA is a perfect fit for production OpenStack deployments, transforming commodity hardware into an elastic, resilient, modern storage solution that keeps pace with changing business requirements.

Hedvig and OpenStack – the perfect match

Organizations rely on a wide range of applications and need access to a full set of storage capabilities within OpenStack. Modern web and cloud applications add additional pressure requiring scale-out architectures to meet user demands. In the face of these challenges, traditional storage solutions quickly become a bottleneck.

Hedvig software-defined storage provides simplicity and flexibility for OpenStack initiatives. With block and file storage protocols via Cinder, object storage via Swift, and support for private and public cloud infrastructure you can meet all of your OpenStack requirements without resorting to hard-to-manage islands of storage. Hedvig provides a robust set of advanced storage features needed for OpenStack in production environments.

The Hedvig solution is fully programmable with all of its functionality accessible via REST API. IT and DevOps have at their fingertips everything required to quickly build and deploy an automated, full featured, implicitly hybrid, storage system.





ADVANCED STORAGE FEATURES

- > Cinder and Swift support
- > Mirantis Fuel Plugin
- > iSCSI, NFS, and object protocols
- > All-flash and hybrid disk support
- > Quality of service (QoS) controls
- > Auto-balancing and tiering
- > Client-side SSD/PCIe caching
- > Inline deduplication
- > Inline compression
- > Thin provisioning
- > Tunable replication
- > Cross rack and site disaster recovery policies
- > Self-healing
- > Zero-impact snapshots and clones
- > I/O sequentialization
- > GUI, CLI, REST API, and RPC interfaces

BUSINESS BENEFITS

- > Lower TCO 60% or more
- > Scale to massive capacity
- > Eliminate operational headaches
- > Lower risk of data-loss
- > Eliminate storage downtime
- > Never migrate data again
- > Deliver projects on time



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hedvig.io



The Hedvig Distributed Storage Platform

The Hedvig Distributed Storage Platform provides a single, unified software-defined storage platform with the capabilities you've come to rely on from enterprise storage.

- > The Hedvig Storage Service, a patented distributed systems engine installs on whitebox servers to deliver all of the storage options and capabilities required for an enterprise OpenStack deployment.
- > The Hedvig Storage Proxy, a lightweight storage access layer, runs as a guest VM or Docker container to enable support for any compute environment.

The Hedvig Distributed Storage Platform provides the flexibility to scale compute and storage separately in a hyperscale configuration, as well as together in a hyperconverged solution.

Advantages of OpenStack with Hedvig

Simplify and automate provisioning – spin up any number of virtual disks in just a few seconds. Cinder, Swift, and REST API support enables seamless integration for OpenStack developers.

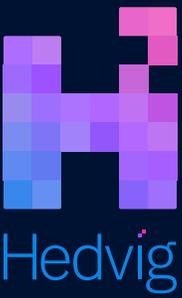
- > Integrate public and private clouds—Build a unified hybrid environment to easily migrate to or from your data center and public clouds.
- > Set granular virtual disk policies—assign enterprise-class features on a per volume basis to best fit your application requirements.
- > Connect to any compute environment—use with any hypervisor, application, or bare-metal system.
- > Grow seamlessly with an elastic cluster—scale storage performance and capacity on-the-fly with off-the-shelf x86 and ARM servers.
- > Deliver predictable performance—massive parallelism, dedicated flash, and edge cache configurations deliver consistent high-IOPS performance for demanding applications.



ABOUT HEDVIG

Built by software engineers of the world's largest distributed systems, Hedvig delivers modern storage for enterprise compute environments running at any scale. Customers such as LKAB, Scania, and GE use the Hedvig platform to transform their storage into a fundamental enabler of digital business strategies.

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Comparing the Hedvig Distributed Storage Platform and Ceph

Software-defined storage solutions promise scale-out capacity and commodity hardware economics. Organizations looking to deploy a solution into production must carefully consider whether a solution meets critical requirements for performance, capacity, efficiency, resiliency, and data protection.

Many software-defined storage products – like Ceph – are based on object store architectures that provide inadequate performance for applications that require low-latency and high IOPS. Ceph’s block and file storage layers run on top of the object store, adding additional latency, slowing

performance. Beyond performance, advanced storage features critical for production environments are absent.

The following table highlights the similarities and differences between the Hedvig Distributed Storage Platform and Ceph. Only Hedvig harnesses the power of distributed systems with a complete set of enterprise capabilities enabling you to tailor a modern, high-performance, elastic storage system to support any application, hypervisor, container, or cloud – including OpenStack-based clouds.

Feature	Hedvig	Ceph
Protocols	Block, File, and Object	
Architecture	Hyperscale and Hyperconverged	Hyperscale
Data placement	Shared metadata based block distribution	Distributed object store (RADOS)
Data layout	Log structured metadata	Log structured object metadata
OS Support	ALL Linux, ALL Windows ALL hypervisors	Limited Linux, limited ESX
Scalability	1000s of nodes	1000s of nodes
Remote DR replication		
sync semi-sync	Yes Yes	Yes No
Number of data copies	Up to 6, selectable per virtual disk	Up to 3
Auto-tiering hybrid disk sets	Yes Yes	No No
Server-side		
SSD/flash cache RAM cache	Yes Yes	No Partial
Client-side		
SSD/Flash RAM Cache	Yes Yes	No Partial
Inline global deduplication	Yes	No
Inline compression	Yes	No
Client side deduplication cache	Yes	No
Number of N+1 active data centers / clouds	Up to 6	Up to 2
Snapshots and clones	Yes	Yes
OpenStack support	Cinder and Swift with any OS	Cinder on KVM only
REST API	Yes	Yes
Feature based QoS	Yes, selectable per virtual disk	No
Multi-Tenancy	Yes	No