Managing Ceph with openATTIC

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Ceph and openATTIC

SUSE's powerful openATTIC admin platform lets you manage your Ceph cluster from the convenience of a browser window.

SUSE® Enterprise Storage is a powerful, self-healing system for cost-efficient storage at scale. The SUSE Enterprise Storage solution is based on the Ceph distributed storage system. Ceph automates the storage process, storing and retrieving data in an object-based, fault-tolerant manner that maximizes disk usage and minimizes admin time.

Your Ceph cluster is highly effective at managing itself, but you might be wondering how a single admin can keep tabs on a vast storage cluster that might contain as much as several petabytes of data. SUSE Enterprise Storage comes with an array of command-line tools that you can use to monitor pools, start and stop daemons, and output status information. But what if you want to manage, monitor, and visualize your SUSE Enterprise Storage cluster through a unified GUI interface?

SUSE Enterprise Storage 5 includes a powerful GUI-based management tool called openATTIC. The openATTIC management environment offers an easy web interface for viewing and administering your Ceph cluster. The simple and convenient structure of the openATTIC interface provides a powerful and intuitive environment for accessing status information, performance data, and configuration settings. Because openATTIC is stateless, it will reflect any changes to the Ceph cluster, including changes made through other tools, so openATTIC gives you the benefit of a graphical interface without locking you into a single configuration tool.

If you are shopping for software-defined storage and you are accustomed to working in a GUI environment, openATTIC will seem quite familiar. SUSE maintains the openATTIC project, and the openATTIC developers are part of the SUSE enterprise Storage development team.

What Is openATTIC?

openATTIC is an open source management and monitoring system for Ceph. The openATTIC management interface provides a single point of contact for managing Ceph components such as:

- *Pools*
- *Object storage daemons*
- *Ceph nodes*
- *iSCSI targets and portals*
- *Ceph block devices*
- *NFS shares (CephFS and S3)*
- *Ceph object gateways*

openATTIC also includes an easy-to-use dashboard that displays graphs and information on the health and performance of the cluster.

The openATTIC web interface is built on well known and widely used open source web development frameworks (Angular JS, Bootstrap) and uses the Python-based Django web application server for the backend and REST API.

openATTIC Architecture

Figure 1 shows the openATTIC architecture. The openATTIC backend is built on the Django web application server and uses Ceph's Librados protocol to communicate with the cluster. The web interface accesses openATTIC through the REST API. The openattic-systemd service is a background process that manages the interaction with the operating system. openATTIC uses a PostgreSQL database for user account information. The modular architecture shown in Figure 1 makes it very easy to add new features and components and adapt openATTIC to new situations.
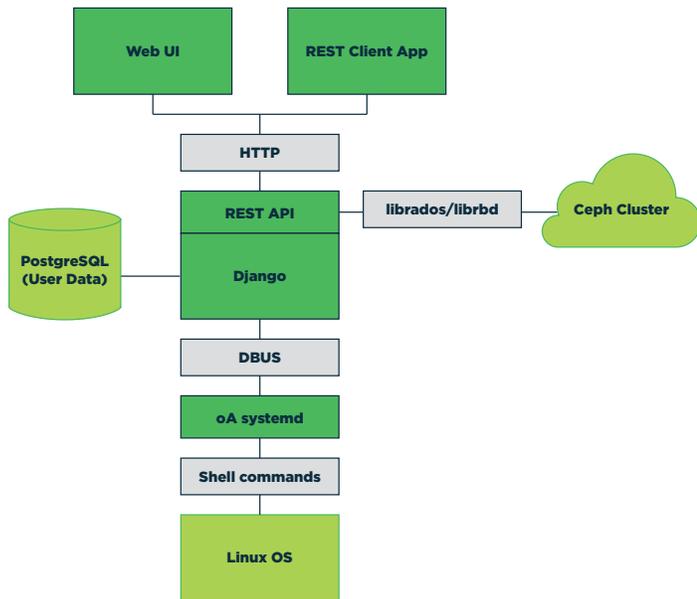
openATTIC — High Level Architecture

Figure 1. *openATTIC is built on the Django framework.*

Getting Started

If you wish to use manage your SUSE Enterprise Storage cluster with openATTIC, you'll need to set up one of the nodes on your Ceph cluster to act as an openATTIC server. SUSE Enterprise Storage lets you deploy openATTIC as a DeepSea role. (See the SUSE Enterprise Storage 5 Deployment Guide for more on the Salt-based DeepSea configuration management system.) Use the following command to give the openATTIC server role to a Salt minion:

role-openattic/cluster/openattic*.sls

By default, the administrative account on the openATTIC server will have the username openattic and the password openattic. Use the oaconfig command to change the password for the openattic account:

oaconfig changepassword openattic

You'll need to enter and re-enter the new password at the prompt. Then restart openATTIC with:

oaconfig restart

to incorporate the changes.

Looking Around

openATTIC is a web service, so you can connect to it using a JavaScript-enabled web browser as you would connect to an internal website. Enter the URL of the openATTIC service in the address bar of a web browser on the network:

ip_address/openattic

Be ready to enter the username and password for the openATTIC administrative account.

When you first log in to openATTIC, you'll see the dashboard *(see Figure 2)*. The following section has more information on how to use the dashboard to monitor your Ceph configuration. The openATTIC main menu appears in the menu bar at the top of the screen. Click on an item in the menu bar to display information related to the item. For instance, click OSDs to view a table of OSDs running in the cluster, including information on status, CRUSH weight, and storage configuration *(see Figure 3)*. Select an OSD in the list to view performance data *(see Figure 4)*. Similarly, you can click Pools in the main menu to view a table of Ceph pools associated with the cluster *(see Figure 5)*. Select a pool in the list to configure and edit pool settings, such as the pool type, CRUSH ruleset, placement groups, and applications *(see Figure 6)*.
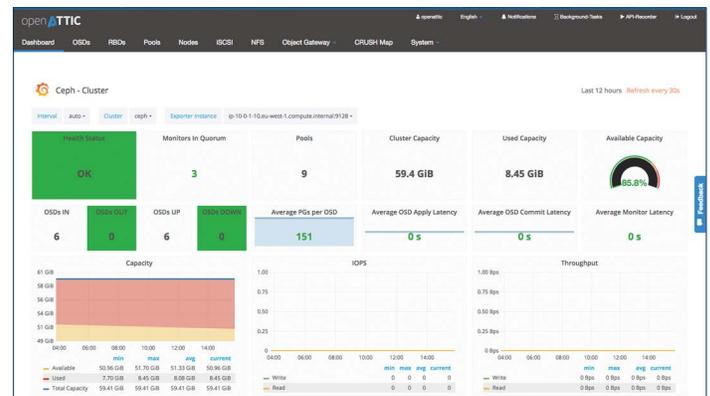

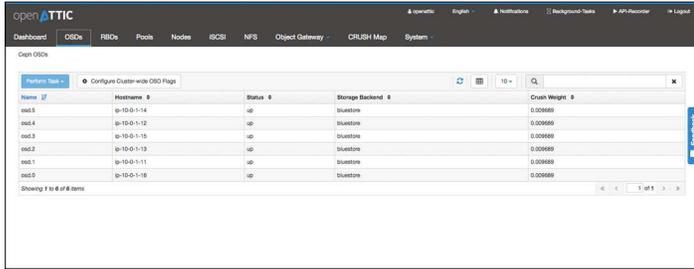**Figure 2.** *The openATTIC dashboard provides a quick summary of cluster health and performance metrics.*

Figure 3. *Viewing the status of Object Storage Daemons (OSDs).*

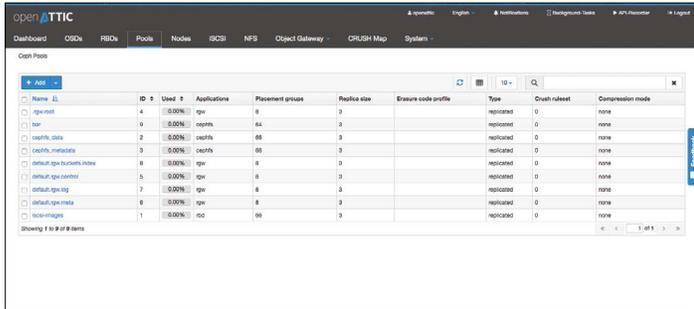**Figure 4.** *Click on an OSD for a summary of performance data.*

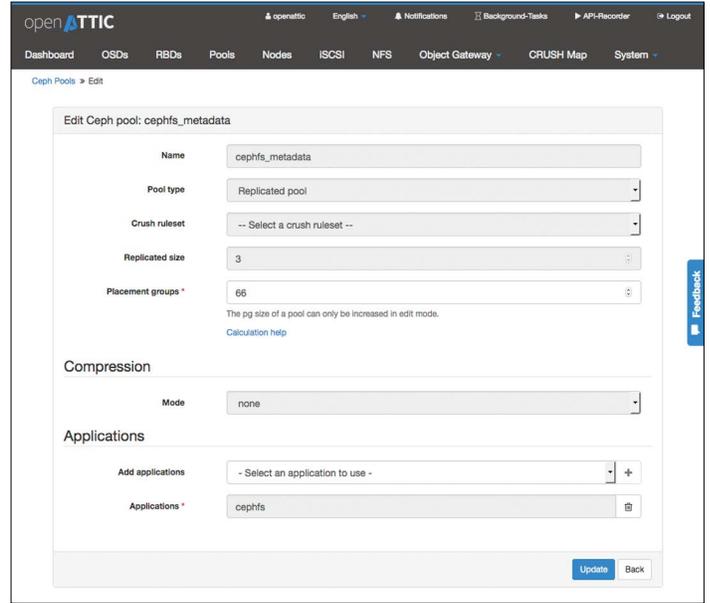**Figure 5.** *The Pools page offers an overview of Ceph pools in the cluster.*

Figure 6. *Editing pool settings in openATTIC.*

The System option on the far-right side of the openATTIC menu *(refer to Figure 2)* lets you configure settings related to open-ATTIC. Select User to add and edit user account settings. Click Settings to configure settings for accessing the Salt REST API, object gateway, and Ceph cluster *(see Figure 7)*.
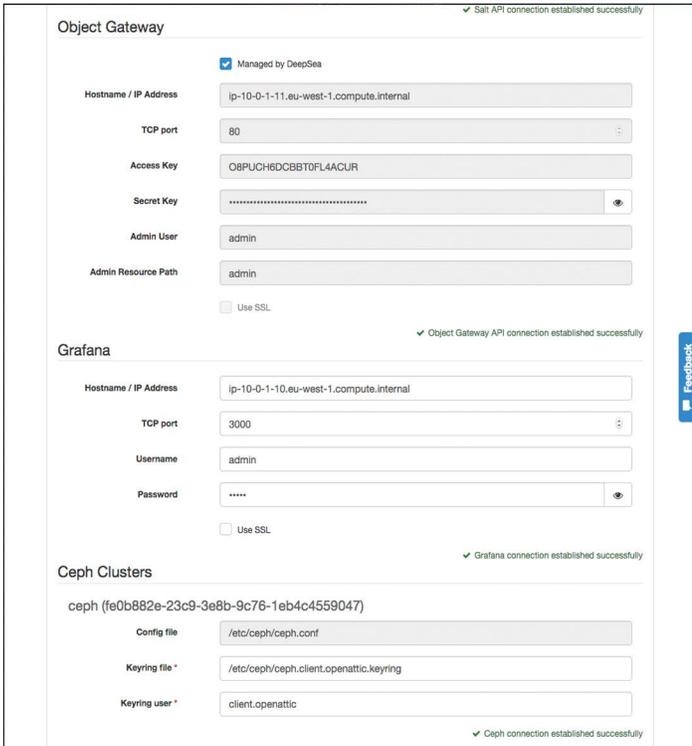
Figure 7. *Configuring settings for the object gateway and Ceph cluster.*

Dashboard

The first thing you'll see when you start openATTIC is the dashboard *(see Figure 2)*. Ceph is fault-tolerant and self-healing, but performance can sometimes vary as the cluster rebalances and redistributes workload. The dashboard provides a practical perch for the admin to search for bottlenecks and drill down through performance metrics.

The top of the dashboard window displays a number of important parameters in singlestat format. Each box has a single value representing an important statistic. The Health Status box in the upper-left corner is perhaps the most important and frequently viewed. If all is well with the cluster, the Health Status box will display OK. If the monitor node perceives a problem, a warning will appear in the Health Status box. The health status warnings are similar to the warnings available through the ceph status

text-based command. Other singlestat boxes display information on the available capacity, latency, and OSD status.

Scroll down in the Dashboard window for graphs and tables tracking cluster usage and performance *(see Figure 8)*. The dashboard graphs help you visualize the state of your Ceph cluster, letting you quickly identify bottlenecks and zero in on performance issues. See the SUSE Enterprise Storage 5 Administration Guide for more on using and interpreting the graphic widgets of the openATTIC dashboard.
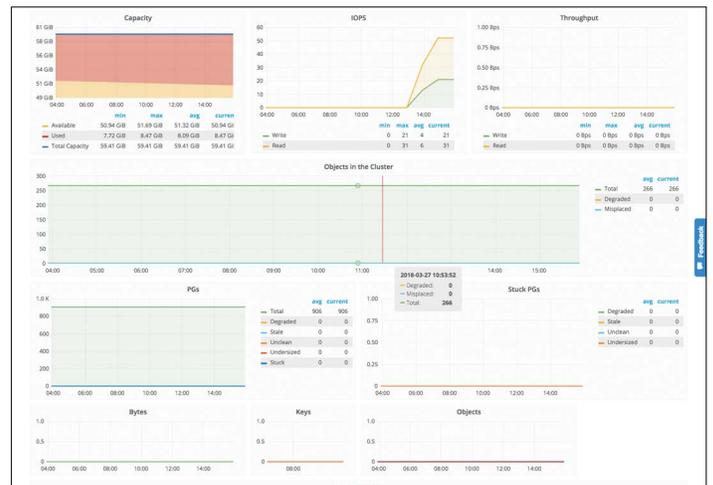

Figure 8. *Scroll down in the dashboard window for performance graphs and other visualization widgets.*

Gateways

Ceph's system of gateways and interfaces allow the cluster to appear to the network in a number of different forms. Ceph's interfaces let the cluster interact with the network as a:

- *RADOS Block Device (RBD)*
- *NFS Gateway*
- *iSCSI Gateway*
- *Object Gateway (compatible with Amazon S3 and OpenStack Swift)*

openATTIC provides options for managing each of these Ceph interface alternatives. For instance, click NFS in the main menu to configure NFS gateway settings *(see Figure 9)*. The RBD,

iSCSI, and Object Gateway options all lead to configuration windows where you can enter and edit interface settings *(see Figure 10)*.
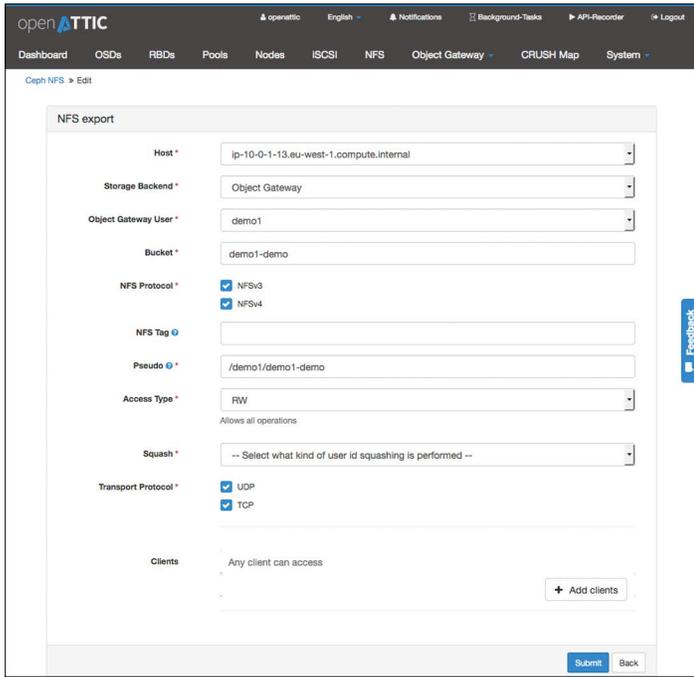

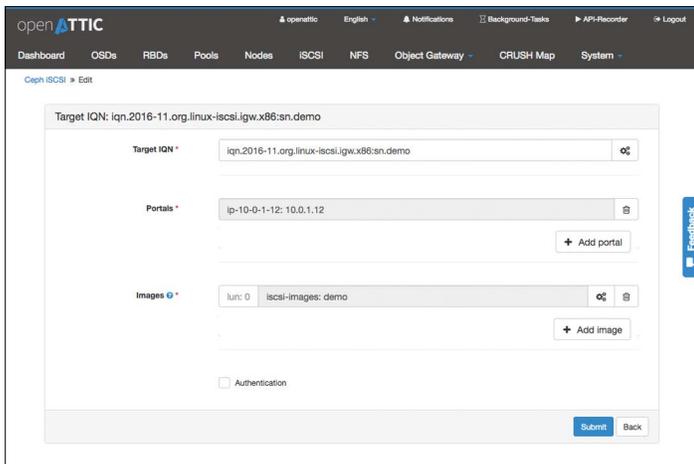**Figure 9.** *Configuring the NFS gateway.*

Figure 10. *Setting up an iSCSI target.*

CRUSH Map

The CRUSH map is the blueprint of your Ceph cluster. Ceph uses the CRUSH map to determine where to store data and how to retrieve it. The CRUSH map is created by the storage administrator, and it evolves dynamically as Ceph recalibrates and adjusts to changing events. Although Ceph maintains the CRUSH map automatically, Ceph admins sometimes need to access CRUSH information to troubleshoot problems and determine how the cluster is making storage decisions.

Select the CRUSH Map option in the openATTIC main window to view the CRUSH Map *(see Figure 11)*.
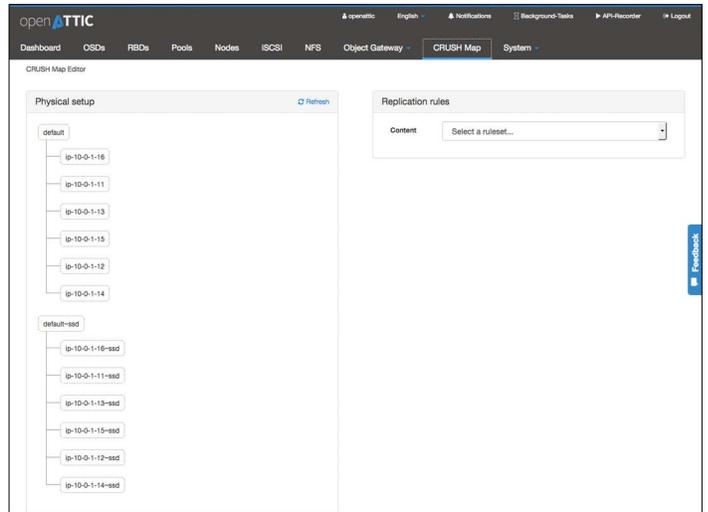

Figure 11. *Viewing the CRUSH map in openATTIC's CRUSH Map window.*

Putting It All Together

The simple yet functional openATTIC user interface makes it easy for an admin to manage vast amounts of data from a single vantage point, helping SUSE Enterprise Storage deliver the lowest cost-per-MB of any enterprise-ready Ceph storage solution. With a little knowledge of Ceph, you will soon learn to move easily among the openATTIC menu options to configure cluster settings, identify and troubleshoot problems, and chase down performance bottlenecks.

openATTIC's convenient, menu-driven management environment is one reason why SUSE Enterprise Storage is a preferred Ceph platform for Windows admins who are accustomed to performing management tasks within a GUI environment.

Contact the experts at SUSE to learn more about how you can deploy openATTIC to manage and monitor your SUSE Enterprise Storage cluster.