



Ceph and Storage Management with openATTIC

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Lenz Grimmer <lgrimmer@suse.com>
Engineering Team Lead
SUSE LINUX GmbH

openATTIC – Our Vision

Develop an alternative to proprietary storage management systems

“Traditional” unified storage (NAS/SAN)

Support Ceph for scale-out scenarios

Open Source, backed with professional support and services

OpenATTIC – Notable Changes

Removed Enterprise/Community Edition split

- Now fully under the GPLv2
- Removed requirement for CLA
- DCA (Signed-off-by) is all that's needed to contribute

Public Issue tracker and roadmap (JIRA)

Public pull requests / code reviews on BitBucket

Monthly releases / nightly snapshot builds

Entire code base (backend/UI/Tests/Docs) in one branch

Part of SUSE since November 2016

openATTIC – Key Aspects

Focus on data center storage management

- Support both SAN and NAS functionality without limitations
- Ceph support

Fully Open Source (GPLv2)

- No arbitrary functional restrictions
- Low entrance barrier for adoption

Based on standard Linux / OSS tools and frameworks

Multiple Linux distributions (Debian/Ubuntu/Red Hat/SUSE)

- Well-established, mature technology stack
- Broad vendor support (e.g. device drivers)
- Broad user base

openATTIC – Open Source Storage Management

- Modern WebUI
- RESTful API (Software-Defined Storage)
- Unified Storage
 - NAS (NFS, CIFS, HTTP)
 - SAN (iSCSI, Fibre Channel)
- LVM, XFS, ZFS, Btrfs, ext3/4
- Volume mirroring (DRBD®)
- Multi-node support
- Monitoring (Nagios/Icinga) built-in
- Ceph management & monitoring
- Development sponsored by SUSE

openATTIC – Components

Backend

- Python (Django)
- Django REST Framework
- Linux tools for storage management (LVM, LIO, filesystem utilities, DRBD, etc.)
- Nagios/Icinga + PNP4Nagios (Monitoring and Graphing)
- Salt / DeepSea (Ceph deployment & management)
- Stick around for Jan Fajerski's talk about DeepSea at 15:00

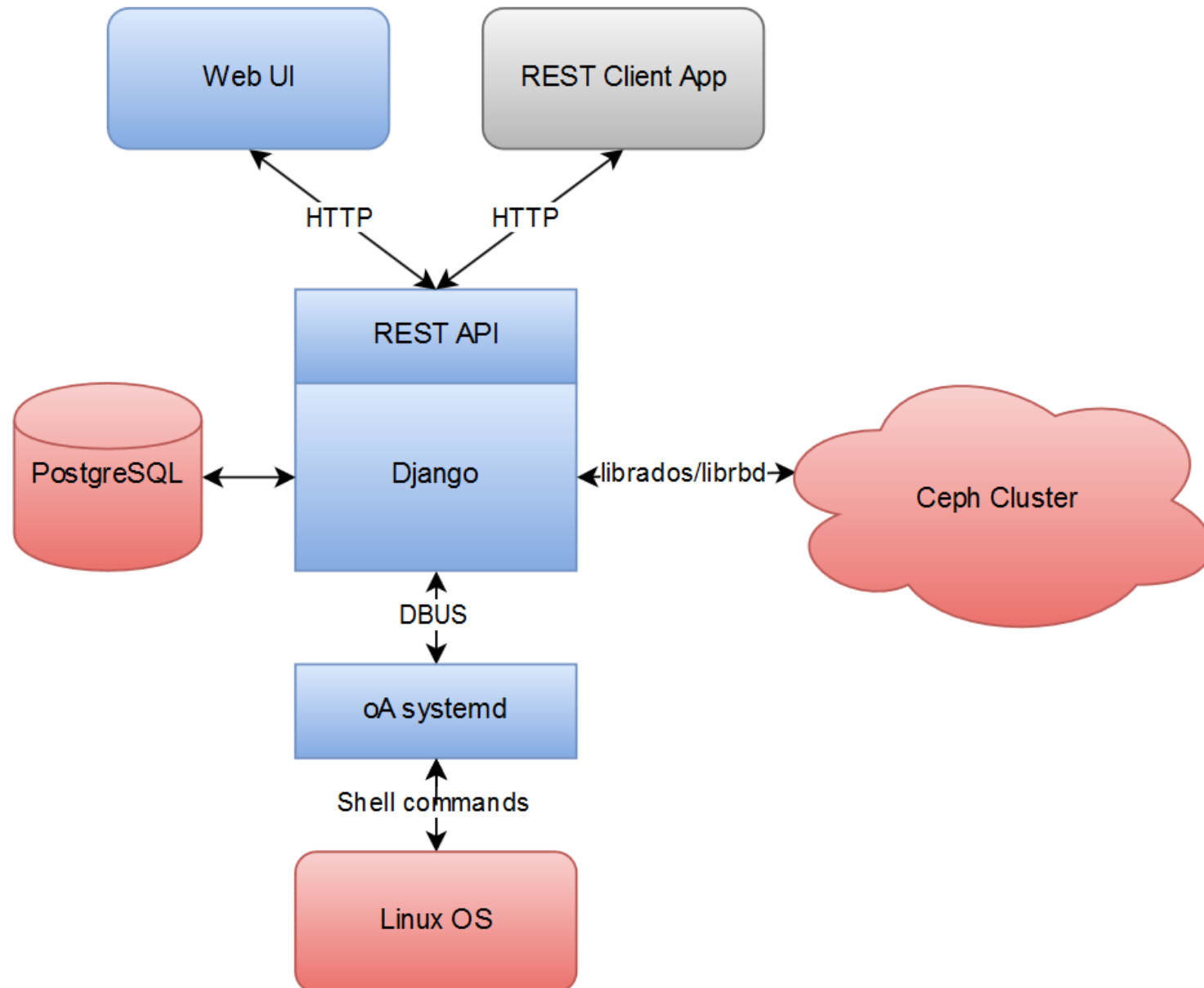
Web Frontend

- AngularJS (JS framework)
- Bootstrap (HTML, CSS and JS framework)
- Uses REST API exclusively

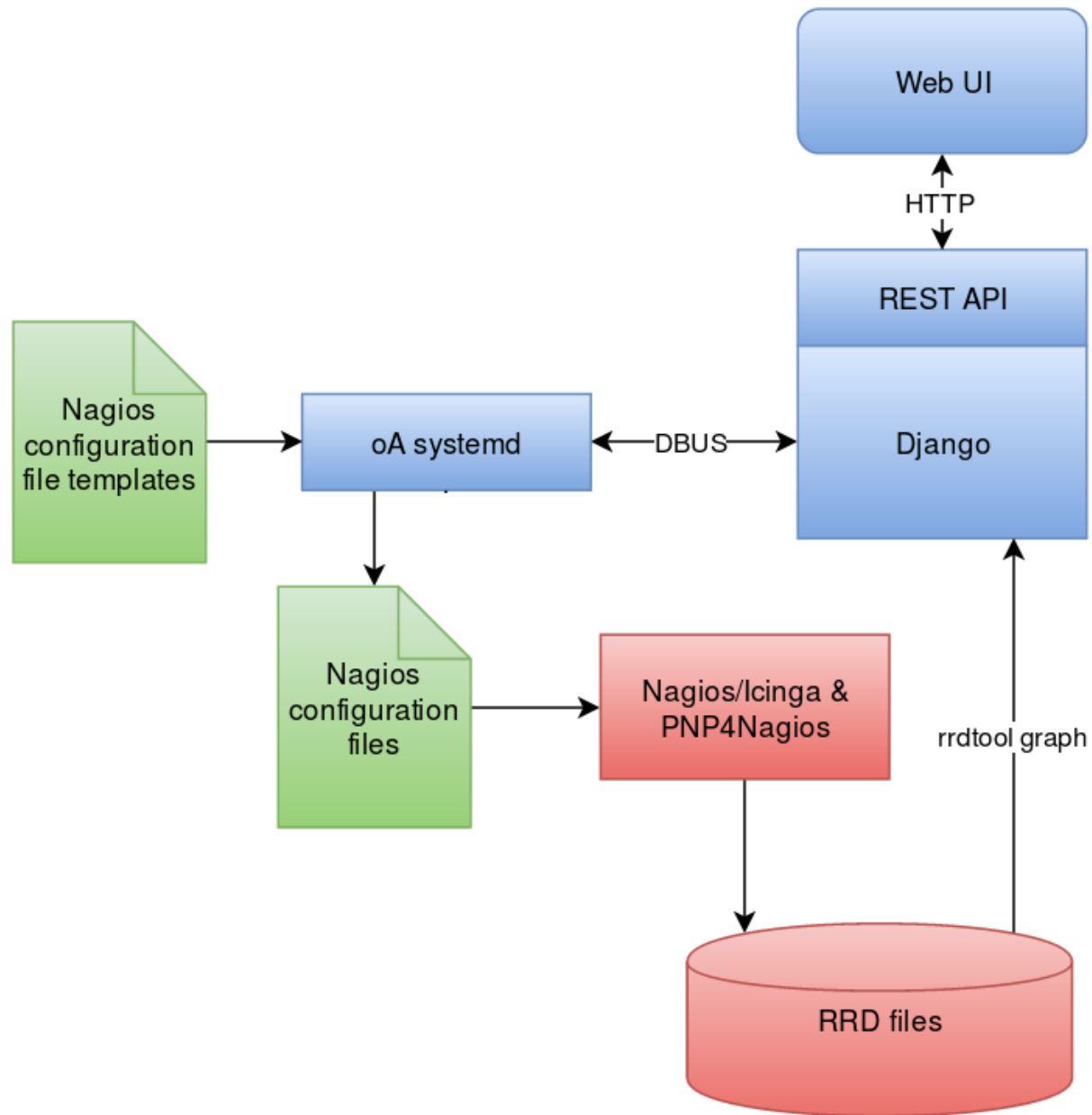
Automated Test Suites

- Python/Django Unit Tests
- REST API Test framework (Gatling)
- WebUI E2E Tests (Protractor/Jasmine)

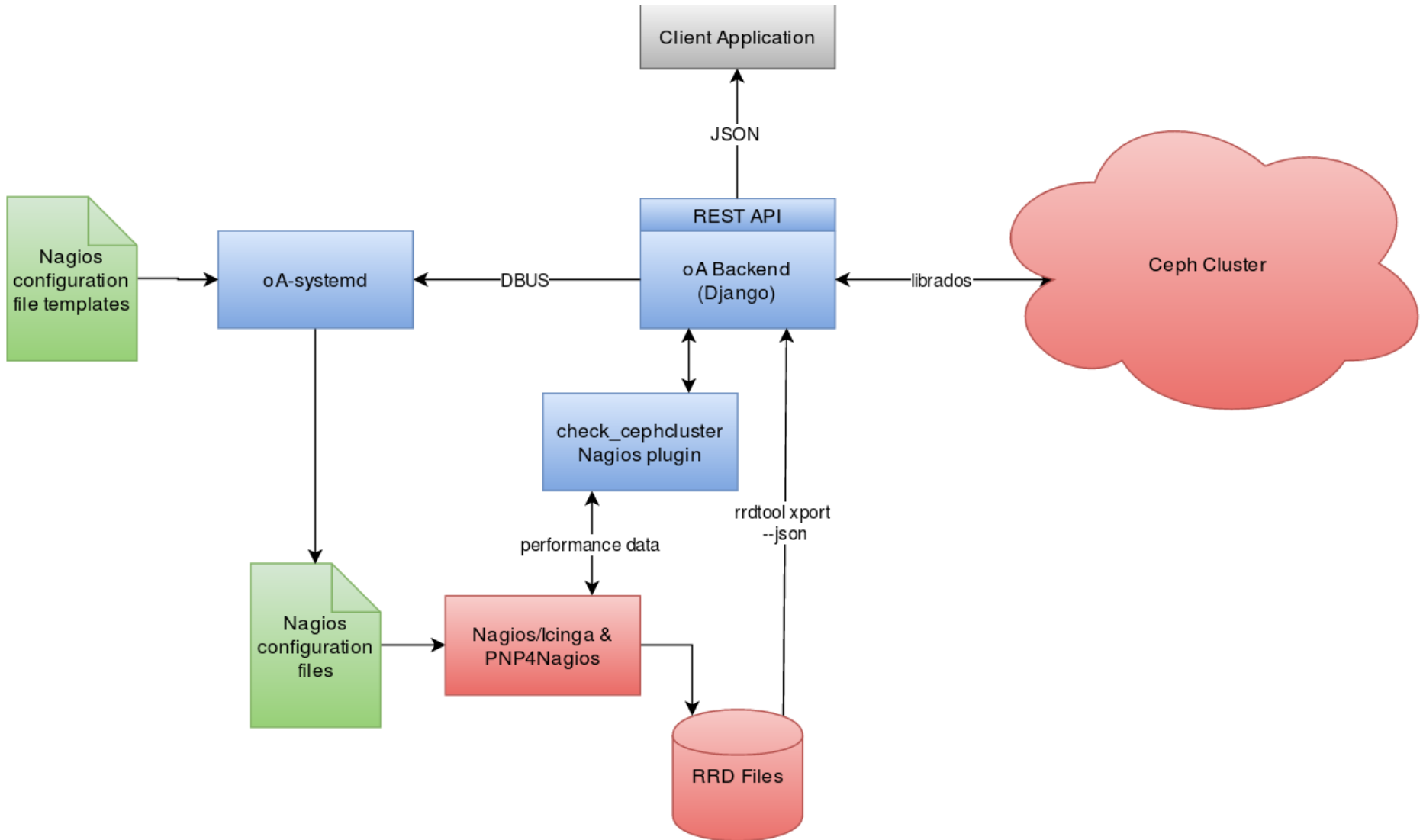
openATTIC – High Level Architecture



openATTIC – Storage Monitoring Infrastructure



openATTIC – Ceph Monitoring Infrastructure



openATTIC – Storage Management Roadmap

Add DRBD volume mirroring to the WebUI (WIP)

Extend Disk and Storage Pool Management functionality

- Creating/Managing LVM Volume Groups
- Creating/Modifying Btrfs/ZFS Pools (incl. RAID setups)
- Automatic discovery of disks/pools (via udev)
- Disk health monitoring (SMART)

Extend SAN functionality (more iSCSI/FC features)

Public Roadmap on the openATTIC Jira/Wiki to solicit community feedback

openATTIC – Ceph Management Goals

Create a management & monitoring GUI tool

A tool that admins actually *want* to use

That scales without becoming overwhelming

Still should allow changes to be made elsewhere, without becoming inconsistent

openATTIC – Current Ceph Development Status

Ceph Cluster Status Dashboard (Performance Graphs, Health Status)

Pool management (view/create/delete)

Pool monitoring

Manage EC profiles

RBD management (view/create/delete/map)

RBD monitoring

OSD management (view)

CRUSH map editor

Support for managing multiple Ceph clusters

openATTIC – Ceph Development Roadmap

Dashboard improvements (more metrics / graphs)

Task Queue WebUI (WIP)

Deployment, remote configuration / role assignment of Ceph nodes
(via Salt Open & SUSE'S "DeepSea framework)

iSCSI target management

OSD Monitoring/Management

RGW Management (e.g. users, buckets, keys) via RGW Admin Ops
API

Extend Pool Management

CephFS Management / Monitoring

Remote node monitoring (via Salt & collectd)

Screenshots

openATTIC – Storage Dashboard

The screenshot displays the openATTIC Storage Dashboard. At the top, the navigation bar includes the openATTIC logo, user information (Sebastian Krahl, API-Recorder, Logout), and menu items (Dashboard, Disks, Pools, Volumes, Ceph, Hosts, System). The main content area is titled "Dashboard" and features a "Default" dropdown menu and buttons for "+ Add Widget" and "+ Add Dashboard".

The dashboard is divided into two main sections:

- openATTIC cluster status:** This section provides a comprehensive overview of the cluster's health and performance. It includes:
 - Live Stats:** A line graph showing "Written data" (blue) and "Network traffic" (red) over time. The y-axis ranges from 0 MB to 100 MB. The x-axis shows timestamps from 17:21:30 to 17:23:00. Both metrics show significant activity, with network traffic peaking around 80 MB.
 - Hosts:** A progress bar indicating 1 / 1 hosts are online.
 - Disks:** A progress bar indicating 4 / 4 disks are available.
 - CPU Load:** A gauge showing a current load of 2% with a trend of -2%.
 - Disk Load:** A gauge showing a current load of 0% with a trend of > 0%.
- openATTIC wizards:** This section offers quick access to various storage configurations:
 - File Storage:** Represented by a folder icon.
 - VM Storage:** Represented by a bar chart icon.
 - iSCSI/Fibre Channel target:** Represented by a cube icon.

openATTIC – Volume Management

openATTIC openattic Record Login

Dashboard Disks Pools **Volumes** Ceph Hosts System

Volumes > ovirt_vms Utilization

Refresh View 10 Search

Name	Size	Used	Status	Protection	Type	Path	Host	Created
ovirt_vms	1.99GB	3.31%	▲		afs	/media/ovirt_vms	demo04.oadev.master.dns	8/10/16 12:09 PM
bank	9.63GB	0.00%	✓		zfs	/media/bank	demo04.oadev.master.dns	8/10/16 12:09 PM
bank2	9.63GB	0.00%	✓		zfs	/media/bank2	demo06.oadev.master.dns	8/10/16 12:09 PM
userdata	9.63GB	91.74%	▲		zfs	/media/bank/userdata	demo04.oadev.master.dns	8/10/16 12:10 PM
vda	1.07TB		▲		unt	/dev/vda	demo04.oadev.master.dns	8/10/16 12:10 PM
vda	1.07TB		▲		unt	/dev/vda	demo05.oadev.master.dns	8/10/16 12:10 PM
vdb	1.07TB		✓		unt	/dev/vdb	demo05.oadev.master.dns	8/10/16 12:10 PM
vdb	1.07TB		▲		unt	/dev/vdb	demo04.oadev.master.dns	8/10/16 12:10 PM
vdz	1.07TB		✓		unt	/dev/vdz	demo06.oadev.master.dns	8/10/16 12:10 PM
vdz	1.07TB		▲		unt	/dev/vdz	demo04.oadev.master.dns	8/10/16 12:10 PM

Showing 1 to 10 of 10 items

Status Statistics CIFS NFS HTTP Storage Snapshots

Utilization Performance

Filter

Volume Usage

Utilization for ovirt_vms - Volume Usage

Cur: 122.30H Min: 66.86H Avg: 120.79H Max: 521.04H

Startzeitpunkt: 4. Februar 2016 12:54:45
Endzeitpunkt: 4. Mai 2016 13:54:45

Disk load

Disk stats for ovirt_vms - Disk Load

Cur: 19.89 Min: 95.36h Avg: 16.04 Max: 39.31

Startzeitpunkt: 8. Juni 2016 12:26:46
Endzeitpunkt: 10. Juni 2016 12:26:46

openATTIC – API Recorder

API Recorder

Replay the actions you recorded by running this Python script:

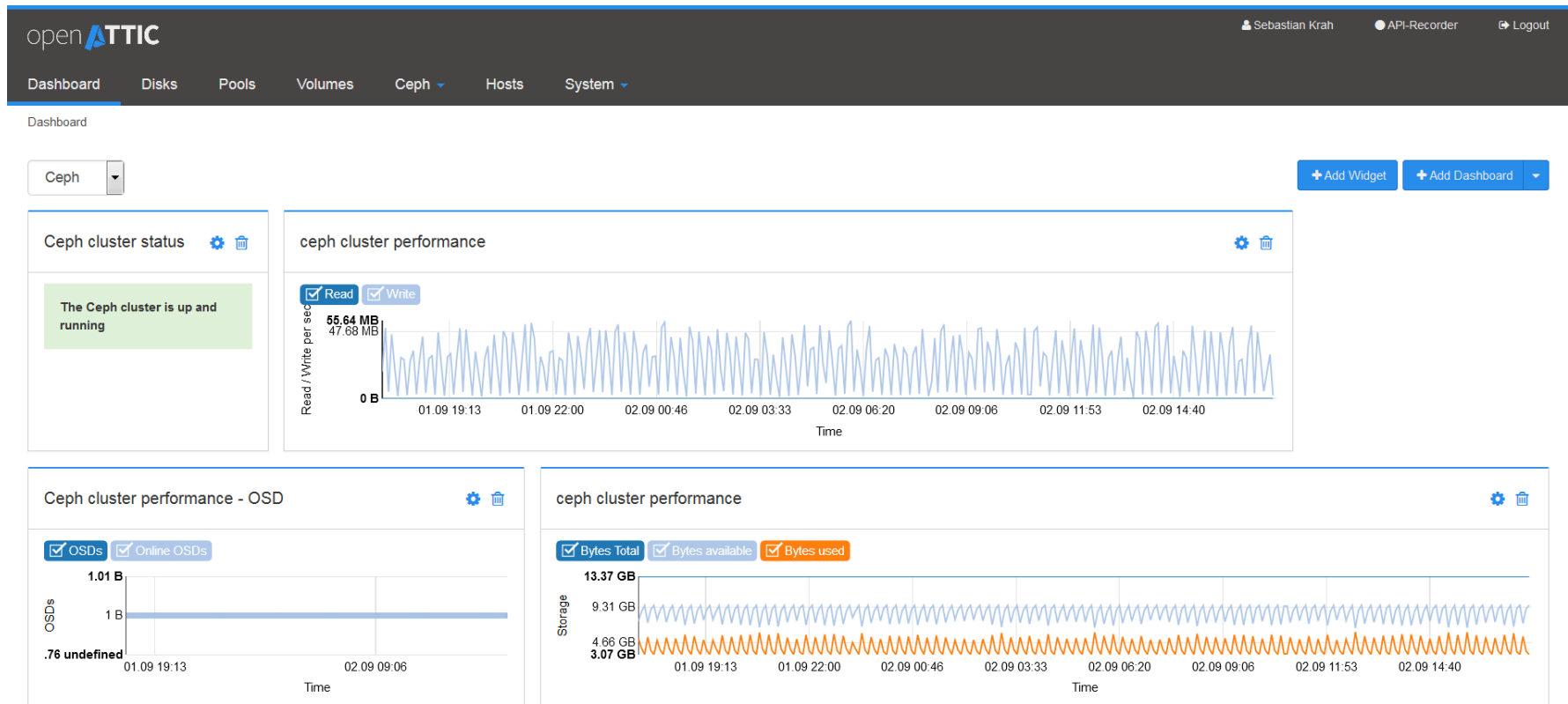
```
#!/usr/bin/env python
import requests
import json
auth = ('username', 'password') # edit username and password

headers = {'content-type': 'application/json'}

### recorded command 1
data=json.dumps({
  "name": "test-vol",
  "source_pool": {
    "id": 5,
    "name": "tank"
  },
},
"filesystem": "zfs",
```

Copy [Close](#)

openATTIC – Ceph Cluster Dashboard



openATTIC – Ceph Pool List

openATTIC openattic API-Recorder Logout

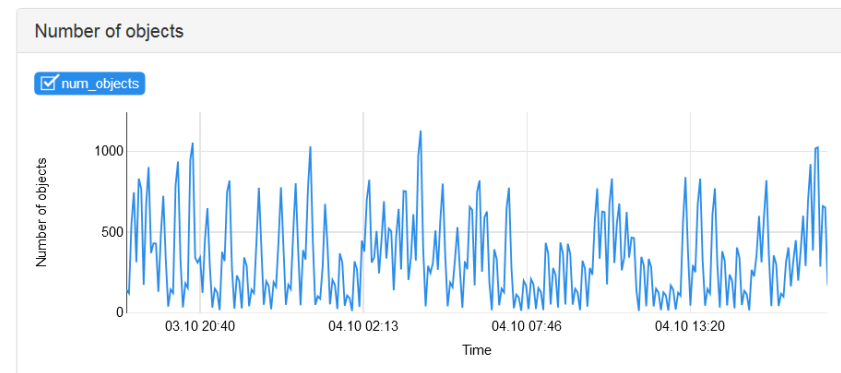
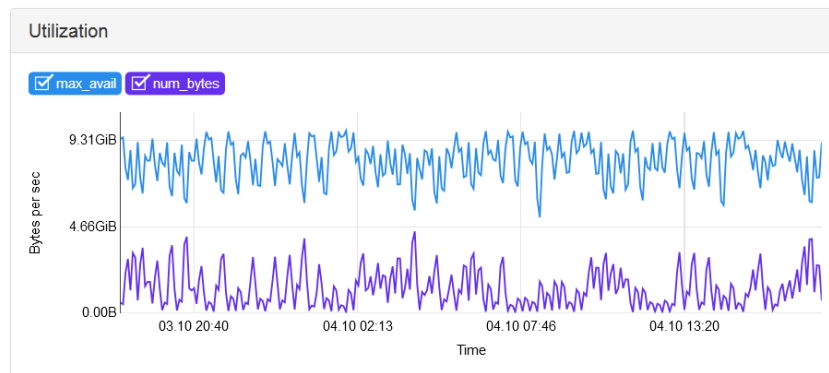
Dashboard Disks Pools Volumes Ceph Hosts System

Ceph Pools > bench statistics

<input type="checkbox"/> Name	ID	Used	Placement groups	Replica size	Erasure code profile	Type	Crush ruleset
<input type="checkbox"/> .rgw.root	3	0.00%	8	1		replicated	0
<input checked="" type="checkbox"/> bench	9	28.96%	64	1		replicated	0
<input type="checkbox"/> cephfs_data	1	0.00%	8	1		replicated	0
<input type="checkbox"/> cephfs_metadata	2	0.00%	8	1		replicated	0
<input type="checkbox"/> default.rgw.control	4	0.00%	8	1		replicated	0
<input type="checkbox"/> default.rgw.data.root	5	0.00%	8	1		replicated	0
<input type="checkbox"/> default.rgw.gc	6	0.00%	8	1		replicated	0
<input type="checkbox"/> default.rgw.log	7	0.00%	8	1		replicated	0
<input type="checkbox"/> default.rgw.users.uid	10	0.00%	8	1		replicated	0
<input type="checkbox"/> rbd	0	0.00%	64	1		replicated	0

Showing 1 to 10 of 10 items

Status Statistics



openATTIC – Ceph Pool Creation

Ceph Pools » Add

Create Ceph pool: testpool

Name	<input type="text" value="testpool"/>
Cluster	<input type="text" value="devJenkinsGui2 (4fa34886-8278-43e1-9034-5764ddca1edd)"/>
Pool type	<input type="text" value="Erasure code pool"/>
Placement groups	<input type="text" value="12"/>
Erasure code profile	<input type="text" value="default"/>

openATTIC – Ceph RBD List

openATTIC openattic API-Recorder Logout

Dashboard Disks Pools Volumes Ceph Hosts System

Ceph RBDs > test-rbd details

Select a Cluster

demo (e90a0c5a-5caa-405a-bc09-a7cfd1874243)

Delete

<input type="checkbox"/> Name	Poolname	Size	Number of objects
<input type="checkbox"/> tele	swimming	1.57 GB	402
<input checked="" type="checkbox"/> test-rbd	swimming	1.00 GB	256
<input type="checkbox"/> bigger	swimming	1.58 GB	405
<input type="checkbox"/> ba	swimming	1.58 GB	405
<input type="checkbox"/> another	swimming	1.58 GB	405

Showing 1 to 5 of 5 items

Status

Details of test-rbd

Name: test-rbd
Block name prefix: rbd_data.2795446a10c7f
Pool: swimming
Size: 1.00 GB
Object size: 4.00 MB
Number of objects: 256

openATTIC – Ceph OSD List

openATTIC openattic API-Recorder Logout

Dashboard Disks Pools Volumes Ceph Hosts System

Ceph OSDs

<input type="checkbox"/> Name ↕	Hostname ↕	Status ↕	Crush Weight	Type
<input type="checkbox"/> osd.0	democeph01	up	0.009995	osd
<input type="checkbox"/> osd.1	democeph02	up	0.009995	osd
<input type="checkbox"/> osd.2	democeph03	up	0.009995	osd
<input type="checkbox"/> osd.3	democeph04	up	0.009995	osd
<input type="checkbox"/> osd.4	democeph05	up	0.009995	osd

Showing 1 to 5 of 5 items « < 1 of 1 > »

openATTIC – Ceph RBD List

Ceph RBDs > test-rbd details

Select a Cluster

demo (e90a0c5a-5caa-405a-bc09-a7cfd1874243)

Delete Refresh Grid 10 Search

<input type="checkbox"/> Name	Poolname	Size	Number of objects
<input type="checkbox"/> tete	swimming	1.57 GB	402
<input checked="" type="checkbox"/> test-rbd	swimming	1.00 GB	256
<input type="checkbox"/> bigger	swimming	1.58 GB	405
<input type="checkbox"/> ba	swimming	1.58 GB	405
<input type="checkbox"/> another	swimming	1.58 GB	405

Showing 1 to 5 of 5 items << < 1 of 1 > >>

Status

Details of test-rbd

Name: test-rbd
Block name prefix: rbd_data.2795446a10c7f
Pool: swimming
Size: 1.00 GB
Object size: 4.00 MB
Number of objects: 256

openATTIC – Ceph RBD Creation

Ceph RBDs » Add

Create RBD: testrbd

Name

Cluster

Pool
0 bytes of 9.78 GB used 9.78 GB free - [use max](#)

Size

Expert settings

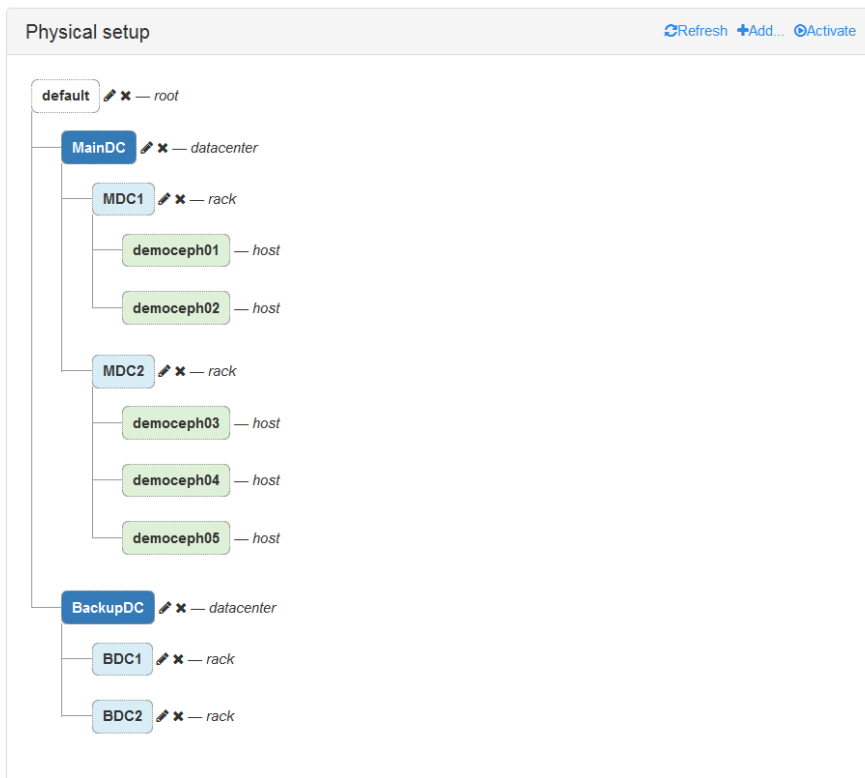
Object size

Features

- Deep flatten
- Layering
- Striping
- Exclusive lock
- Object map
- Journaling
- Fast diff

openATTIC – CRUSH Map Editor

CRUSH Map Editor



Replication rules

+Add

Content both_dcs

Replicas

Minimum	Maximum
3	10

three replicas means "the original file + two copies".

Placement

Place two to nine replicas on different hosts in the MainDC datacenter.

Place one replica in the BackupDC datacenter.

+ Add

openATTIC – Resources

- www.openattic.org
- demo.openattic.org
- blog.openattic.org
- docs.openattic.org
- bitbucket.org/openattic
- tracker.openattic.org
- Twitter: @openattic
- G+: openATTIC

Questions?

