Ceph and Storage Management with openATTIC
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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

Diagram:
- Web UI
- REST Client App
- REST API
- PostgreSQL
- Django
- Ceph Cluster
- oA systemd
- Shell commands
- Linux OS

Connections:
- HTTP from Web UI and REST Client App to REST API
- DBUS from Django to oA systemd
- librados/librbd from Django to Ceph Cluster
openATTIC – Storage Monitoring Infrastructure

Diagram:
- Web UI
- HTTP
- REST API
- Django
- oA systemd
- DBUS
- Nagios configuration files
- Nagios/icinga & PNP4Nagios
- rrdtool graph
- RRD files
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
openATTIC – Volume Management
openATTIC – API Recorder

Replay the actions you recorded by running this Python script:

```python
#!/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"
    }
)
```
openATTIC – Ceph Cluster Dashboard
openATTIC – Ceph Pool List
openATTIC – Ceph Pool Creation
openATTIC – Ceph RBD List

<table>
<thead>
<tr>
<th>Name</th>
<th>Poolname</th>
<th>Size</th>
<th>Number of objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>rbd</td>
<td>swimming</td>
<td>1.57 GB</td>
<td>402</td>
</tr>
<tr>
<td>rbd</td>
<td>swimming</td>
<td>1.00 GB</td>
<td>256</td>
</tr>
<tr>
<td>rbd</td>
<td>swimming</td>
<td>1.55 GB</td>
<td>405</td>
</tr>
<tr>
<td>rbd</td>
<td>swimming</td>
<td>1.55 GB</td>
<td>405</td>
</tr>
<tr>
<td>rbd</td>
<td>swimming</td>
<td>1.55 GB</td>
<td>405</td>
</tr>
</tbody>
</table>

Showing 1 to 5 of 6 items
openATTIC – Ceph OSD List

<table>
<thead>
<tr>
<th>Name</th>
<th>Hostname</th>
<th>Status</th>
<th>Crush Weight</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>osd0</td>
<td>democeph01</td>
<td>up</td>
<td>0.00985</td>
<td>osd</td>
</tr>
<tr>
<td>osd1</td>
<td>democeph02</td>
<td>up</td>
<td>0.00985</td>
<td>osd</td>
</tr>
<tr>
<td>osd2</td>
<td>democeph03</td>
<td>up</td>
<td>0.00985</td>
<td>osd</td>
</tr>
<tr>
<td>osd3</td>
<td>democeph04</td>
<td>up</td>
<td>0.00985</td>
<td>osd</td>
</tr>
<tr>
<td>osd4</td>
<td>democeph05</td>
<td>up</td>
<td>0.00985</td>
<td>osd</td>
</tr>
</tbody>
</table>
openATTIC – Ceph RBD List

<table>
<thead>
<tr>
<th>Name</th>
<th>Poolname</th>
<th>Size</th>
<th>Number of objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>test-rbd</td>
<td>swimming</td>
<td>1.00 GB</td>
<td>256</td>
</tr>
<tr>
<td>bigger</td>
<td>swimming</td>
<td>1.58 GB</td>
<td>405</td>
</tr>
<tr>
<td>bs</td>
<td>swimming</td>
<td>1.58 GB</td>
<td>405</td>
</tr>
<tr>
<td>another</td>
<td>swimming</td>
<td>1.58 GB</td>
<td>405</td>
</tr>
</tbody>
</table>

**Details of test-rbd**

<table>
<thead>
<tr>
<th>Name:</th>
<th>test-rbd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block name prefix:</td>
<td>rbd_rbd.7f51446510c7f</td>
</tr>
<tr>
<td>Pool:</td>
<td>swimming</td>
</tr>
<tr>
<td>Size:</td>
<td>1.00 GB</td>
</tr>
<tr>
<td>Object size:</td>
<td>40.00 MB</td>
</tr>
<tr>
<td>Number of objects:</td>
<td>256</td>
</tr>
</tbody>
</table>
openATTIC – Ceph RBD Creation

Create RBD: testrbd

- Name: testrbd
- Cluster: devjekinsGui2 (4fa34886-8278-43e1-9034-5764ddc1add)
- Pool: bia (9.78 GB free)
- Size: 5.00 GB
- Object size: 4 MB
- Features: Deep-flatten, Object map, Fast diff

Create
openATTIC – CRUSH Map Editor
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?