Ceph and Storage Management with openATTIC

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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 commercial 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
Public Jira Bug Tracker (Issue tracking & roadmap)
Public pull requests / code reviews on BitBucket
Monthly releases / nightly snapshot builds
Entire code base (Backend/WebUI/Test/Docs) in one branch
openATTIC – What Sets us Apart?

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 Linux / OSS tools

Multiple Linux distributions (Debian/Ubuntu/Red Hat/SUSE)
• Well-established technology stack (e.g. drivers, hardware support)
• Broad user base
openATTIC – Open Source Storage Management

• Modern Web UI
• 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 and monitoring
• Development sponsored by it-novum
openATTIC – Components

**Backend**

• Python (Django)
• Django REST Framework (RESTful API)
• Linux tools for storage management, e.g. LVM, LIO, filesystem utilities, DRBD, etc.
• Nagios/Icinga & PNP4Nagios (Monitoring and Graphing)

**Web Frontend**

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

**Automated Test Suites**

• Python Unit Tests
• REST Backend Tests (Gatling)
• WebUI Tests (Protractor/Jasmine)
openATTIC – High Level Architecture
openATTIC – Storage Management Roadmap

Add Disk and Storage Pool Management to the API & WebUI
- Creating/Modifying LVM Volume Groups / MD RAID setups
- Creating/Modifying Btrfs/ZFS Pools (incl. RAID setups)
- Automatic discovery of disks/pools (via udev)
- Monitoring Disk health (SMART)
- Manage HW RAID controllers

Add DRBD volume mirroring support to the WebUI

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 administrators 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 incl. Performance Graphs
“NoDB” and “TaskQueue” backend architecture in place
First prototype implementation of the DeepSea integration
Pool management/monitoring (view/create/delete)
Manage erasure code profiles
OSD management (view)
RBD management (view/create/delete/map)
RBD monitoring
Cluster health/performance & pool monitoring
CRUSH map editor
Support for managing multiple Ceph clusters
openATTIC – Ceph Development Roadmap

TaskQueue implementation for long-running tasks
Extend Pool Management
OSD Monitoring/Management
RBD Management/Monitoring
CephFS Management /Monitoring
RGW Management (users, buckets keys)
Deployment, remote configuration of Ceph nodes (via Salt Open & SUSE’s “DeepSea” framework)
Remote node monitoring (via Salt/collectd)
openATTIC – Storage Dashboard
openATTIC – Volume Management
openATTIC – API Recorder

```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({
    "megs": 5120,
    "name": "testvol",
    "source_pool": {
        "id": 8
    },
    "filesystem": "xfs"
})
```
openATTIC – Ceph Cluster Dashboard
openATTIC – Ceph Pool List

<table>
<thead>
<tr>
<th>Name</th>
<th>ID</th>
<th>Used (%)</th>
<th>Placement groups</th>
<th>Replica size</th>
<th>Erasure code profile</th>
<th>Type</th>
<th>Crush set</th>
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<tr>
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<td>6d</td>
<td>1</td>
<td>replicated</td>
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</tr>
</tbody>
</table>

**Status**

**Number of objects**

![Graph of utilization vs. Time](image1.png)

![Graph of number of objects vs. Time](image2.png)
openATTIC – Ceph Pool Creation
openATTIC – Ceph OSD List

![Ceph OSD List](image_url)
openATTIC – Ceph RBD list

<table>
<thead>
<tr>
<th>Name</th>
<th>Pseudoname</th>
<th>Size</th>
<th>Number of objects</th>
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<td>256</td>
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<tr>
<td></td>
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</tr>
<tr>
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<tr>
<td></td>
<td>swimming</td>
<td>1.58 GB</td>
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</tr>
</tbody>
</table>

Showing 1 to 5 of 5 items
openATTIC – Ceph RBD Creation
openATTIC – Ceph CRUSH map editing
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 / Discussion
Thank you!