Introduction to CoprHD: An Open Source Software Defined Storage Controller

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CoprHD.github.io
Agenda

- CoprHD Overview and Architecture
- Demo
- Community Engagement
- Help Needed
Software Defined Storage (SDS) Architecture

Software Defined Storage (SDS) brings “cloud” benefits to storage, including auto-provisioning, self service, and single pane of glass for management.

A key enabler of the new SDS architecture is an SDS controller for single pane of management.

SDS CONTROLLER
- Visibility and control of ALL storage resources
- Communication between apps, orchestrator, and storage systems
- Allocates storage resources to meet SLAs

APPLICATIONS

ORCHESTRATOR

Northbound API

SDS CONTROLLER

Southbound API

Storage Systems

Open Source + Standard Server

ISV + Standard Server

Traditional (e.g., SAN, NAS, AFA)
What is CoprHD?

An “open source” SDS controller that discovers, pools, and automates the management of a heterogeneous storage ecosystem

1. Discover heterogeneous storage systems (traditional, scale-out, SAN/IP networking, host config, across one or more DCs for new and existing storage)

2. Classify storage using policies (virtual storage arrays and pools)

3. End to end storage automation (intelligent resource selection and placement, local and remote protection, SAN zoning, host attach, migration and tech refresh)

4. Self-service provisioning via REST APIs and catalogs

5. Integrate with traditional, cloud, cloud native computing stacks

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[Diagram of CoprHD components and integration with other technologies]
What CoprHD is NOT

- Storage system life-cycle management tool
- A capacity planning, alerting, chargeback, and historical reporting tool
  - CoprHD can integrate with and complement those tools
- You don’t need CoprHD if ...
  - Your storage ecosystem consists only of built-in storage as part of a hyper-converged system (e.g. VSAN storage built into vSphere)
Why CoprHD and Open Source SDS Controller?

- Storage automation is a universal challenge
- With many very hard problems to solve
  - Provisioning, placement, geo-protection, migration, optimization, and tech refresh
- Create a project focused on solving them well
- Then plug in everywhere, including OpenStack, VMWare, Microsoft and Cloud Native Computing
CoprHD in OpenStack “Big Tent”

Keystone API
Security & Tenancy

Cloud Controller

EC2 API
VMs, Volumes, Networks

Glance API
VM Image Registry

Swift API
Object Storage

Nova API
VM Management

Neutron API
Network Management

Cinder API
Volume Management

Manila API
Filesystem Management

CoprHD
Heterogeneous Storage Ecosystem

CoprHD as a Drop-in alternative for storage automation
CoprHD Architecture

**Active active configuration, state-less services, do not share any resources**

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dbsvc</td>
<td>Comprises a distributed column-based database used as a persistence layer for all provisioning data (Cassandra backed)</td>
</tr>
<tr>
<td>coordinatorsvc</td>
<td>Offers distributed shared memory used for cluster coordination (ZooKeeper based)</td>
</tr>
<tr>
<td>controllersvc</td>
<td>Performs asynchronous operations on storage devices and comprises all of the device-specific code</td>
</tr>
<tr>
<td>apisvc</td>
<td>Provides all public APIs for storage provisioning and storage management</td>
</tr>
<tr>
<td>authsvc</td>
<td>Provides the authentication APIs</td>
</tr>
<tr>
<td>portalsvc</td>
<td>Implements the CoprHD web-based GUI</td>
</tr>
<tr>
<td>sasvc</td>
<td>Offers automation services on top of the provisioning APIs</td>
</tr>
<tr>
<td>syssvc</td>
<td>Provides various system management and monitoring interfaces, access to internal logs, etc.</td>
</tr>
</tbody>
</table>
DEMO
Licensing & Governance

- Independent project – not currently in a Foundation
- Source code (mostly Java) is licensed under Mozilla 2.0
- Governance – forming now!
  - Technical Steering Committee
  - Committers
  - Contributors & Users
  - Open for comments now: [https://coprhd.atlassian.net/wiki/display/COP/Governance](https://coprhd.atlassian.net/wiki/display/COP/Governance)
- Open for contribution since mid-August
CoprHD Community Resources


- **Developer Wiki** (Confluence)
- **Source Code Repository** (Stash)
- **Issue Tracking** (Jira)
- **CI/CD** (Jenkins)

CoprHD public HipChat room

CoprHD Developer Google group

Atlassian

HipChat

Google Groups
Community Engagement

- Discussions underway with 50+ companies to bootstrap the CoprHD community
  - Storage Vendors
  - Enterprises and Academic Institutions
  - Channel & Technology Partners
  - Open source projects: OpenStack, Mesos, Kubernetes
- We need you to join the community!
New Projects – Your Help Needed!

- CoprHD development distro support
  - Docker Image
  - CoprHD Vagrant
  - CoprHD PowerShell Client
- Improve CoprHD OpenStack Integration
  - Natively implement Cinder/Manila API to simplify drop-in replacement in OpenStack
- CoprHD Driver SDK
  - Simplify the process of adding support for new storage systems
- Container ecosystem integration
  - Create plug-ins for Docker libstorage, Mesos, Kubernetes
- Improve intelligent placement algorithms
  - SLO-based Placement and Resource Selection
- Drivers for more storage systems
Upcoming Events – You are invited!

- December CoprHD developer meet-up (hosted by Oregon State University) in Corvallis, Oregon
THANK YOU

CoprHD.github.io