Red Hat Storage Console 3

Unified Management of Ceph and Gluster

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Principal Product Manager
May 3, 2017

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Agenda

May 3, 2017
Red Hat Summit

- Introduction
- Why Red Hat Storage?
- What's new in the upcoming release of Storage Console?
- Architectural Overview
- Business Value
- Features
- Console UI
- Roadmap
- QA

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Introduction: Why Red Hat Storage?

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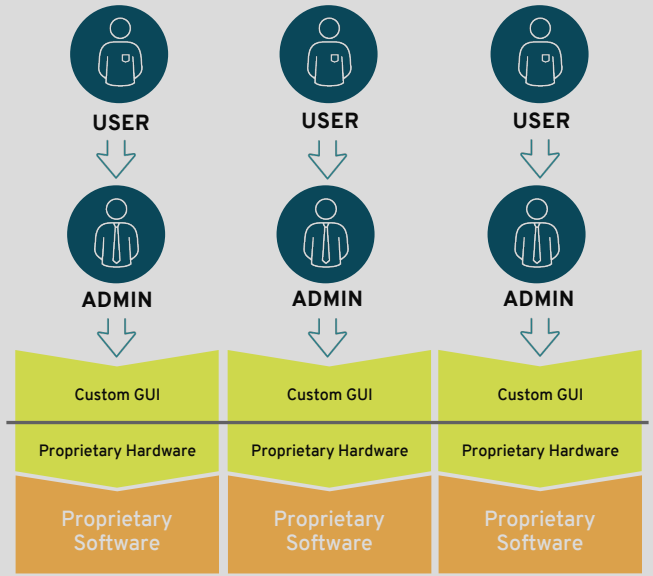
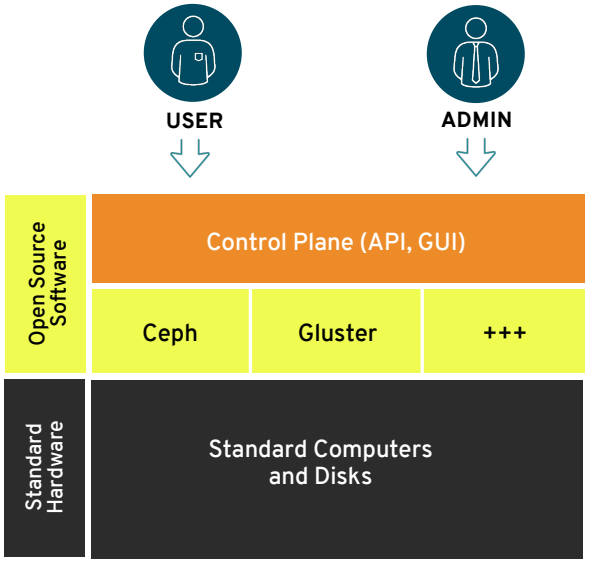
STORAGE IS EVOLVING



RED HAT IS LEADING



A RISING TIDE

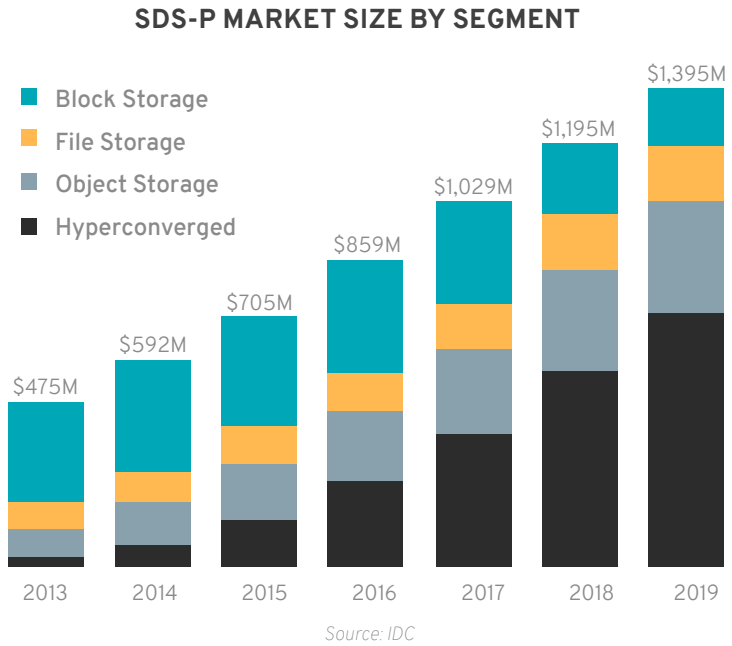
Software-Defined Storage is leading a shift in the global storage industry, with far-reaching effects.

"By 2020, between 70%-80% of unstructured data will be held on lower-cost storage managed by SDS."

Innovation Insight: Separating Hype From Hope for Software-Defined Storage

"By 2019, 70% of existing storage array products will also be available as software-only versions."

Innovation Insight: Separating Hype From Hope for Software-Defined Storage



GARTNER MAGIC QUADRANT

Figure 1. Magic Quadrant for Distributed File Systems and Object Storage

Source: Gartner (October 2016)

This graphic was published by Gartner, Inc. as part of a larger research document and should be evaluated in the context of the entire document. The Gartner document is available upon request at https://engage.redhat.com/gartnermagic-quadrant-storage-s-201610121525

Red Hat Storage recognized as a **Visionary** by Gartner in their first Magic Quadrant for Distributed File Systems and Object Storage.

Red Hat Storage positioned furthest and highest in both Completeness of Vision and Ability to Execute in the Visionaries quadrant.

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Storage Console 3

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Red Hat Storage Console: What is it?

- Unified graphical manager for Red Hat Ceph and Gluster storage.
- Based on the PatternFly UI framework for enterprise web applications.
- Focuses on:

Monitoring Dashboard	Fault Alerts
Task management and reporting	Host details, graphs, and network
Storage Provisioning	Cluster Creation / Import

What's New In RH Storage Console 3?

Fall 2017

Architectural Overview

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Architecture

RHS-C 3 is completely redesigned and based on the upstream Tendrl project

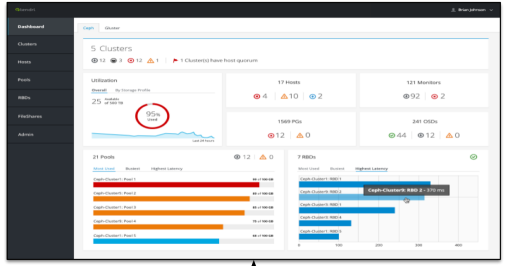
http://www.tendrl.org

http://github.com/Tendrl

Architecture

The design consists of a core which is a trio of

- Node agent (generic service, runs on all nodes)
- Central Store (etcd, HA, connected to all nodes)
- And a stateless, HA, documented API service



tendrl application Instance | tendrl application Instance | tendrl application Instance

tendrl Application (Stateless/Distributed)

Cluster Node | Cluster Node | Cluster Node

Central Store (Clustered / Replicated via etcd)

tendrl Node agent | tendrl-Ceph Bridge | storage hardware abstraction layer | sds processes

Storage Node (Ceph)

tendrl Node agent | tendrl-GlusterFS Bridge | storage hardware abstraction layer | sds processes

Storage Node (Gluster)

tendrl Node agent | tendrl-sds Bridge | storage hardware abstraction layer | sds processes

Storage Node (Generic)

Architecture

The design also consists of the Performance Monitoring module:

- Graphite: Store and graph metrics
- Carbon cache: Makes receiving & storing data efficient

- CollectD to feed generic host data to Graphite
- Custom Tendrl modules to feed Ceph and Gluster specific data to Graphite

Business Value

Makes distributed SDS storage easier!

Operational consistency and efficiency
(streamlined provisioning, enhanced discovery, and management via the integrated service dashboard).

Easily install or import Ceph 2.x or Gluster 3.2 storage “on demand”

Get important information about storage utilization to help troubleshoot and diagnose issues (noisy neighbor, flaky disks, network bottlenecks)

Business Value

Achieve comprehensive visibility with a unified view of Ceph and Gluster storage infrastructure in a single console.

Proactively monitor and manage health, performance, and capacity utilization and gain operational intelligence at scale.

Receive alerts for operational issues requiring intervention.

Red Hat Storage Console 3: Features

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Feature Overview

Install, manage and monitor any SDS Storage (Future proofed by design)

Graph real-time data from the Ceph Calamari API and Gluster-D services to manage & monitor health, performance and capacity

Provisioning: (RADOS pools, RBDs, Gluster Bricks and Volumes, etc.)

Alert on operational issues: (OSD state, Cluster state, Failed Drive..)

Cluster and per node utilization, IOPs, performance, statistics

Features:

RED HAT®
CEPH STORAGE

Integrated Ceph Dashboard (utilization, IOPs, trends, issues)

Graphical installation of Ceph (via Ceph-Ansible)

Import existing Ceph 2.x clusters

Discover and add hosts, create cluster

Expand cluster (add mon's/osd's)

OSD add/remove/set state

Create / resize storage pools and RADOS Block Devices

Features:

RED HAT®
GLUSTER STORAGE

Integrated Gluster Dashboard (utilization, IOPs, trends, issues)

Graphical installation of Gluster (via gDeploy / Ansible)

Import existing Gluster 3.2+ clusters

Discover and add hosts, create trusted pool

Expand cluster

Add/Remove bricks

Supports Distributed replicated and EC volumes

Console UI

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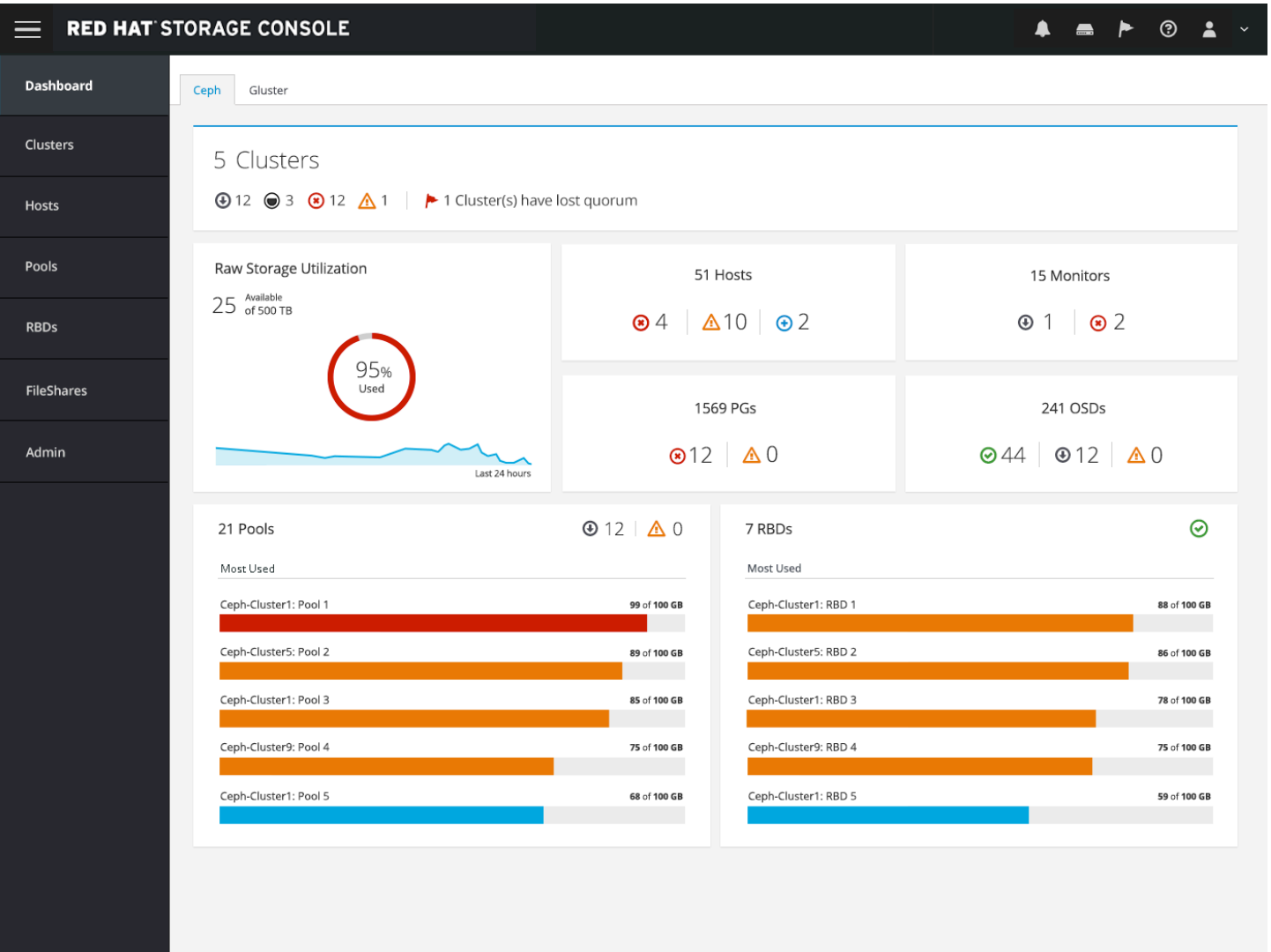
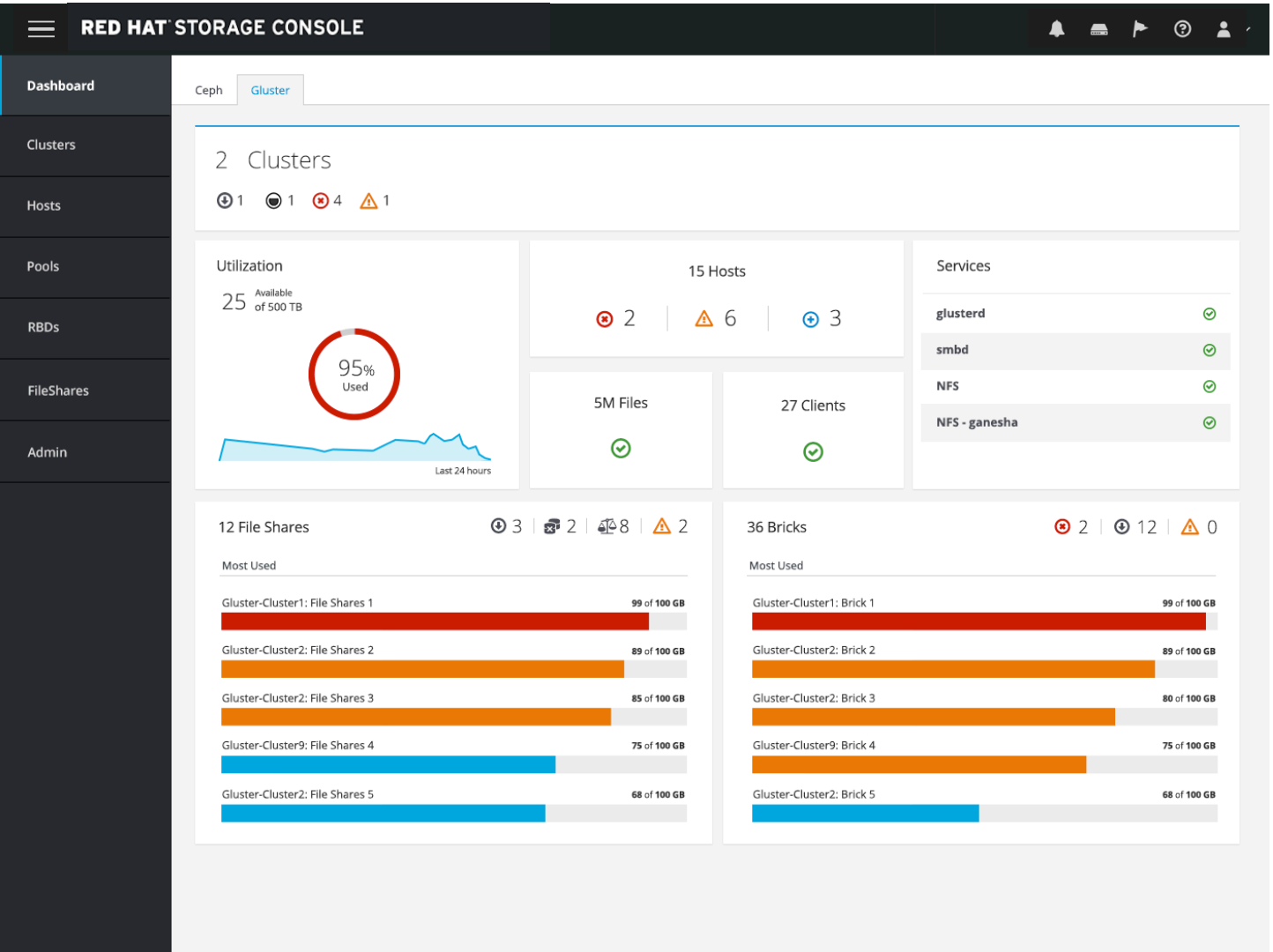
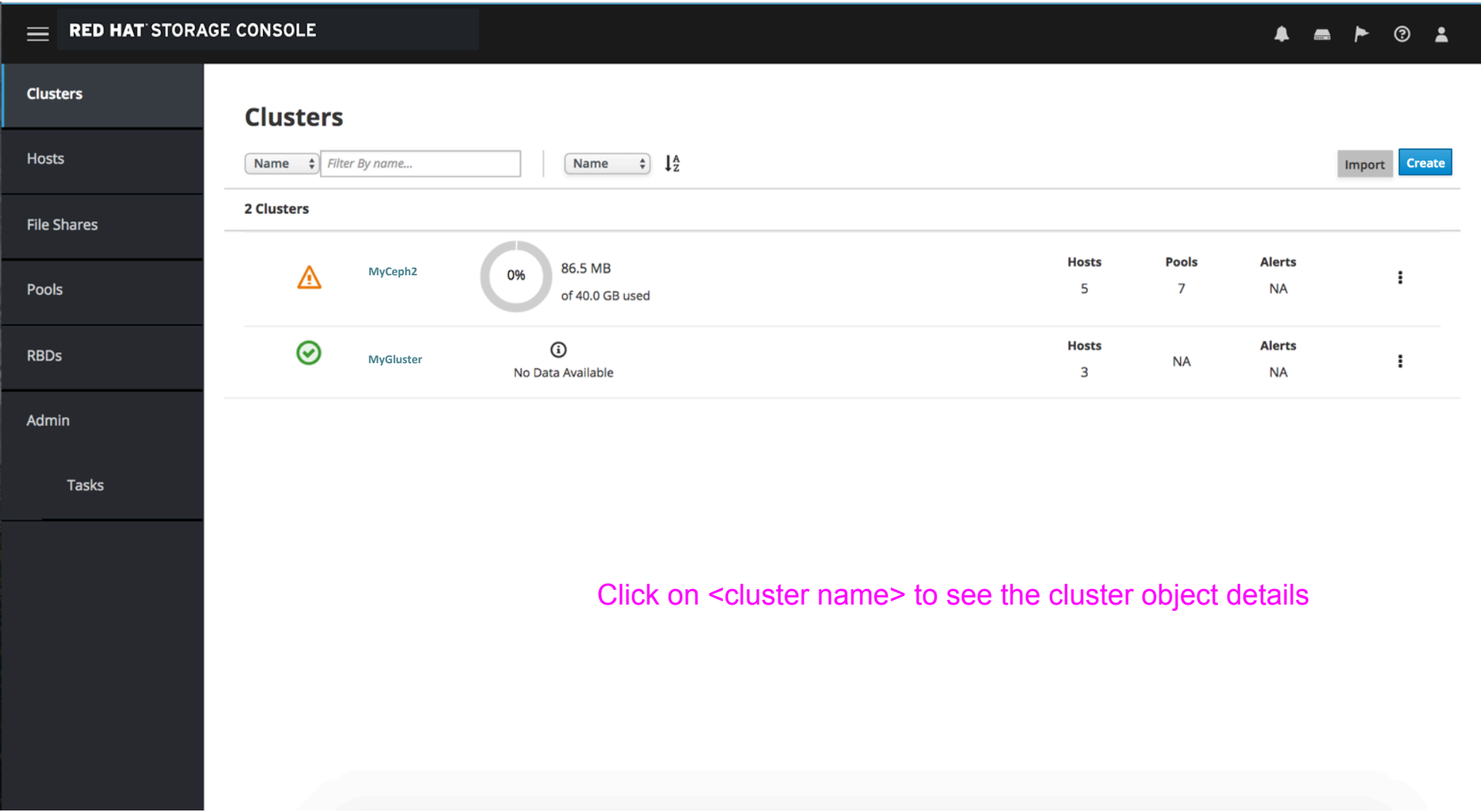
Dashboards..

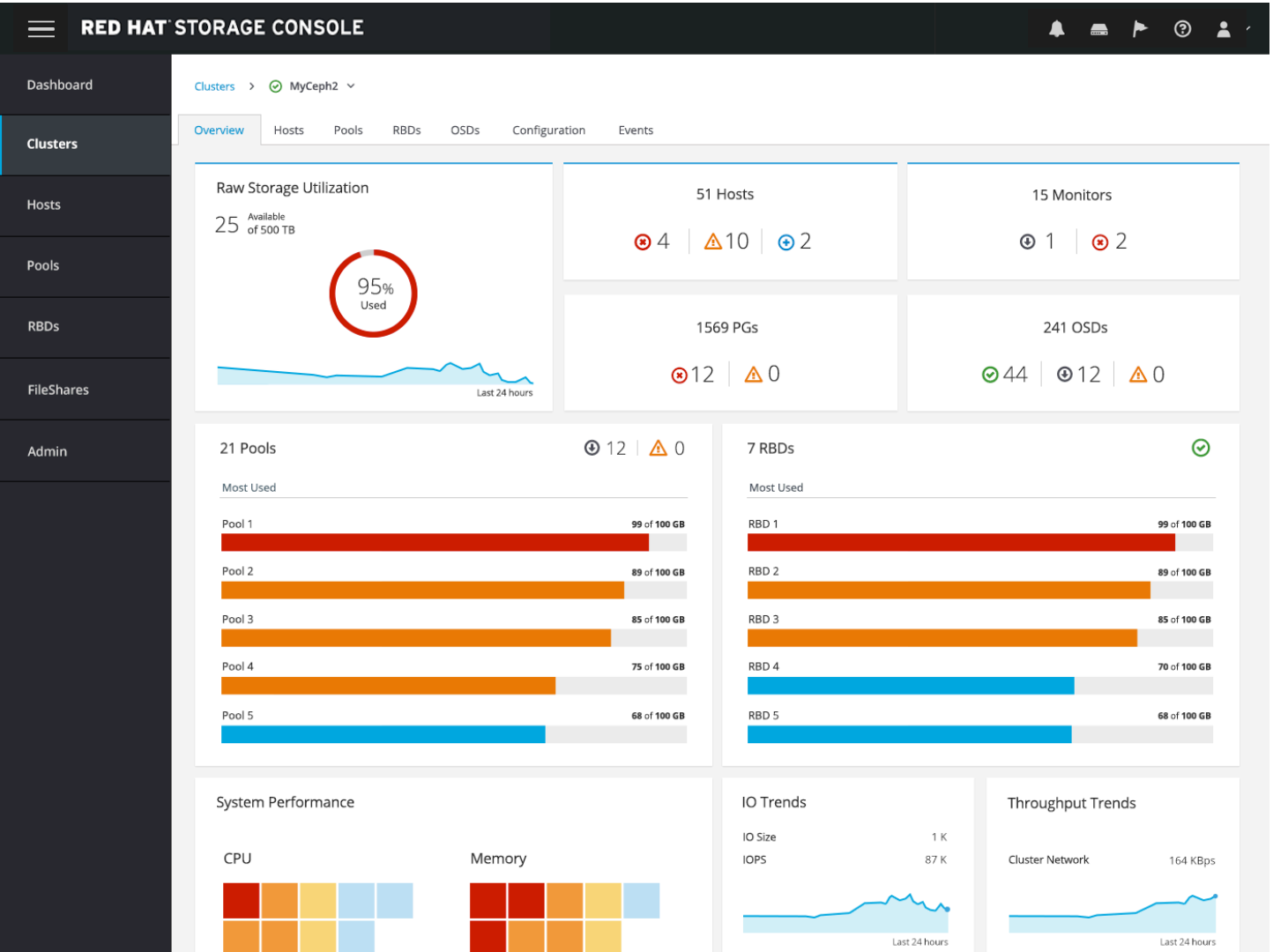


Ceph Clusters (Multi-Cluster View)

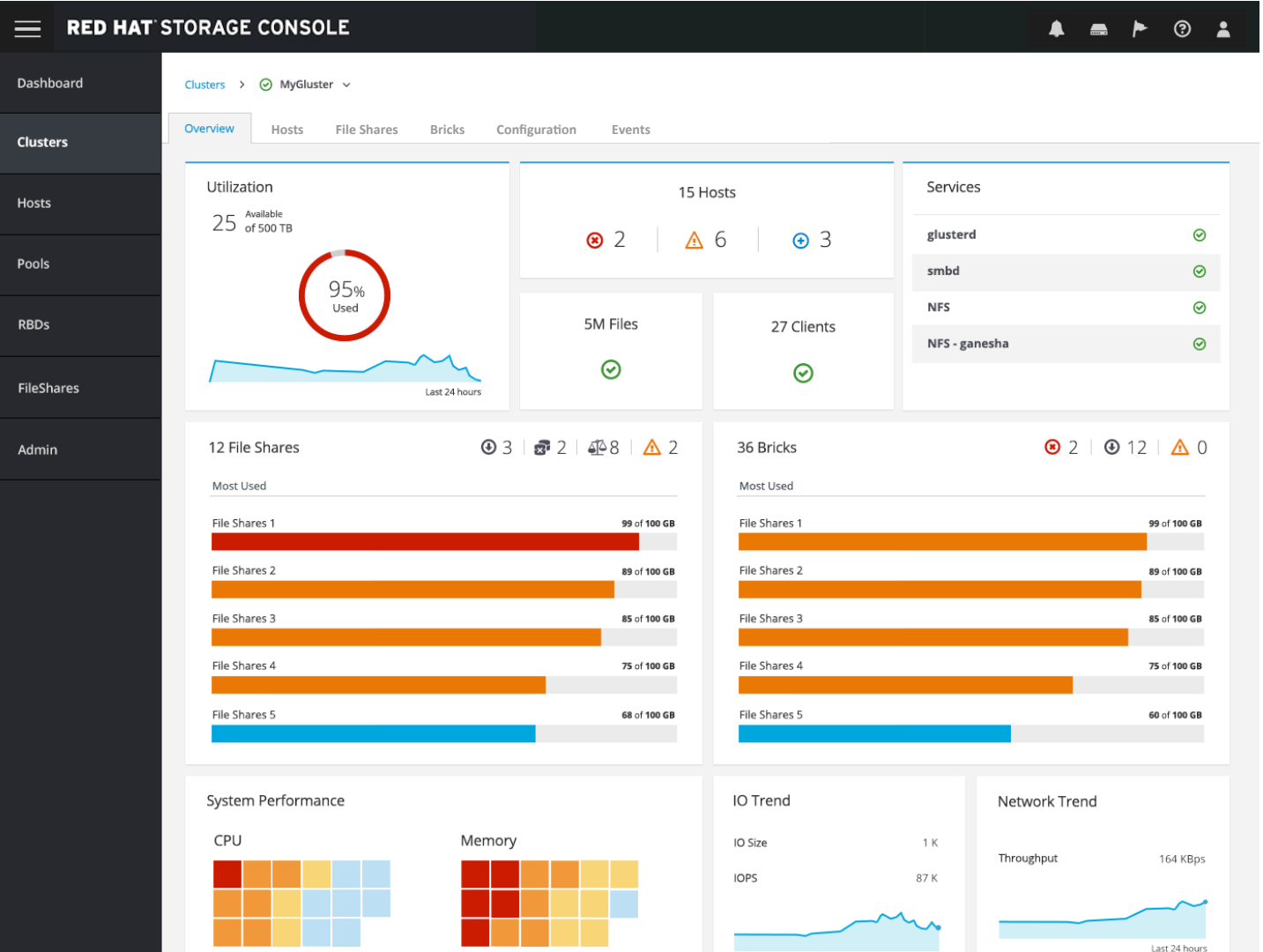


Gluster Trusted Pools (Multi-Cluster View)

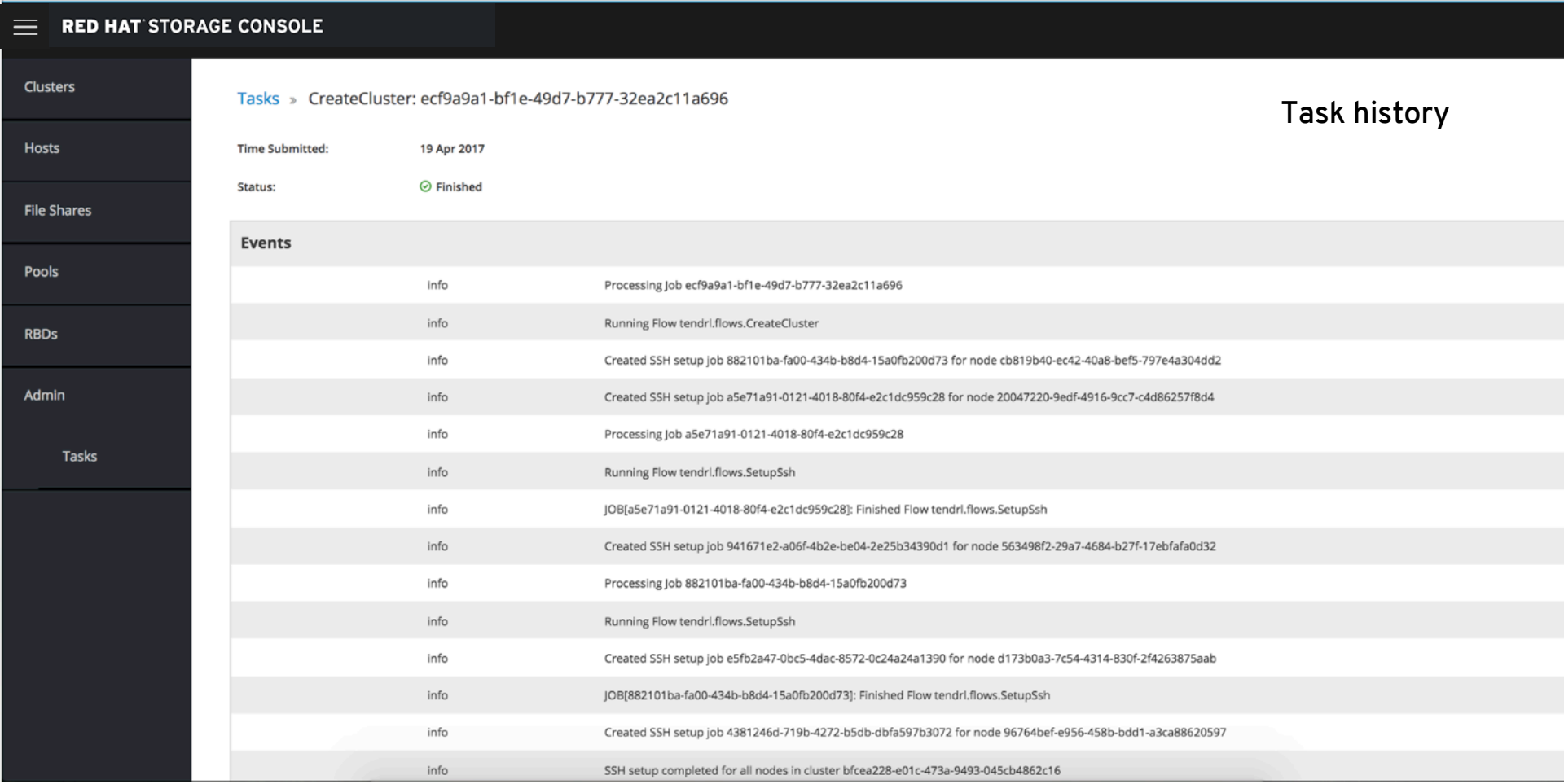

RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
Tasks
Clusters
Name
Filter By name...
Name
Import
Create
2 Clusters
MyCeph2
0%
86.5 MB
of 40.0 GB used
Hosts
5
Pools
7
Alerts
NA
MyGluster
No Data Available
Hosts
3
NA
Alerts
NA
Click on <cluster name> to see the cluster object details

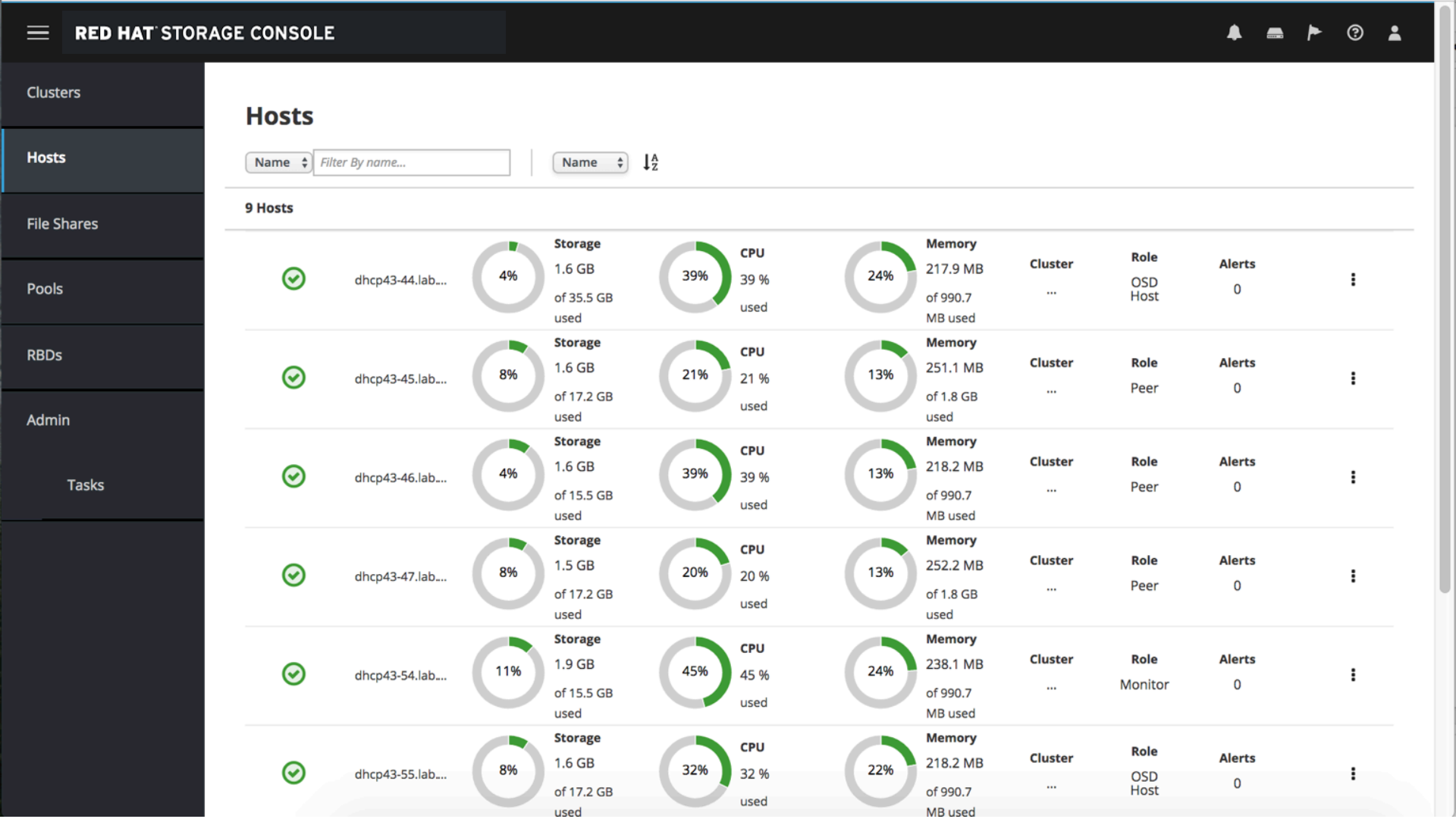


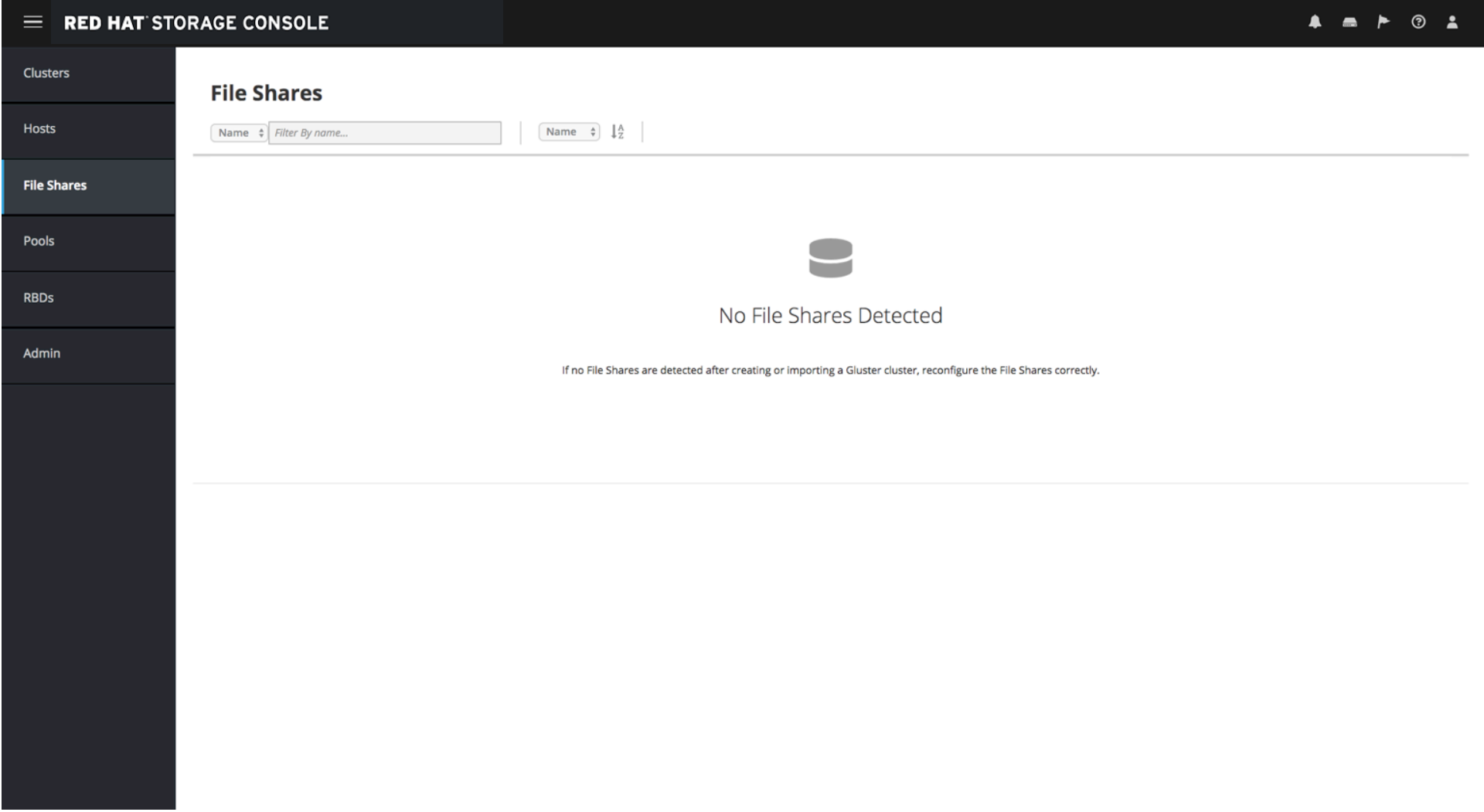
Ceph Dashboard

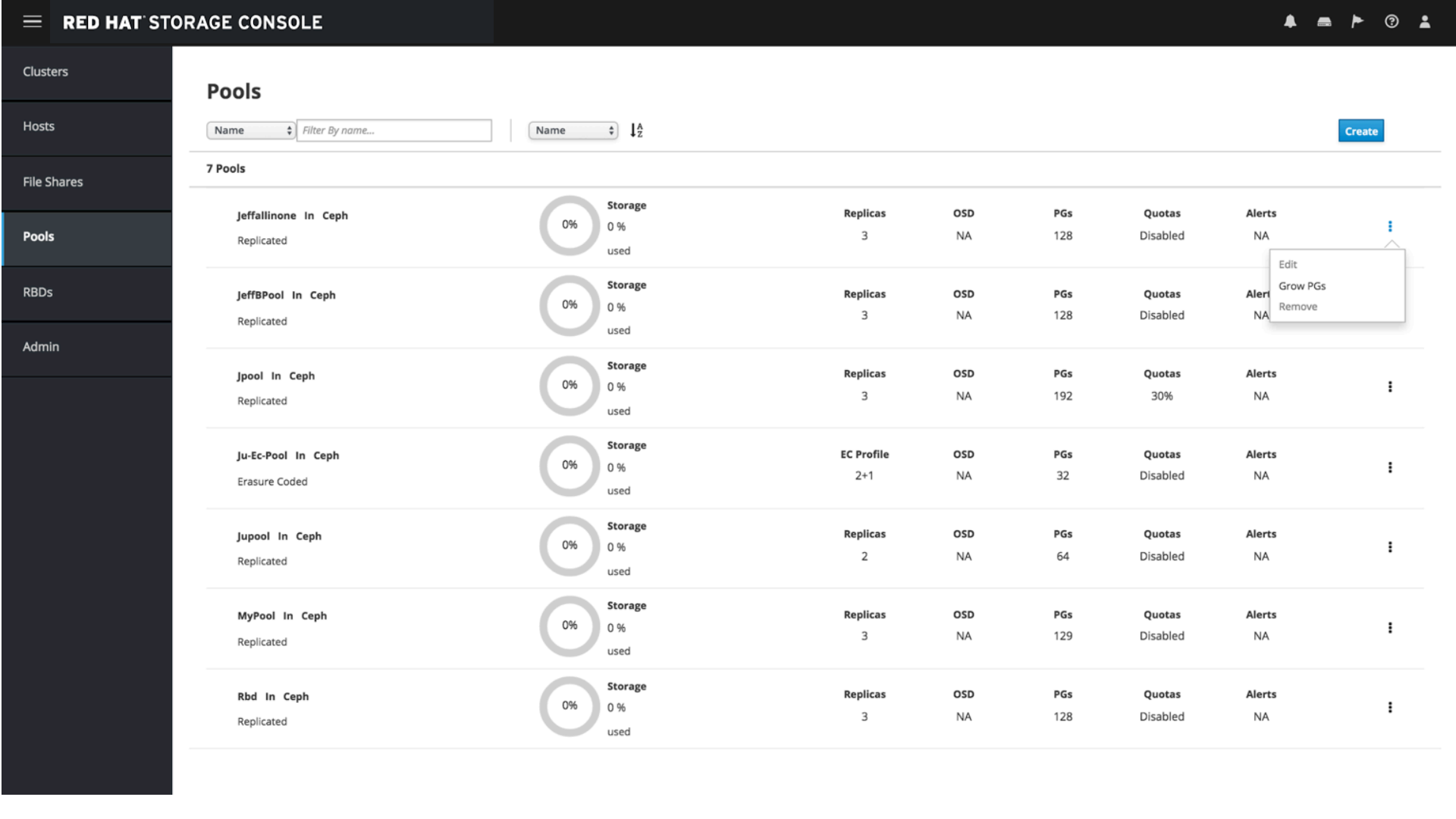


Gluster Dashboard

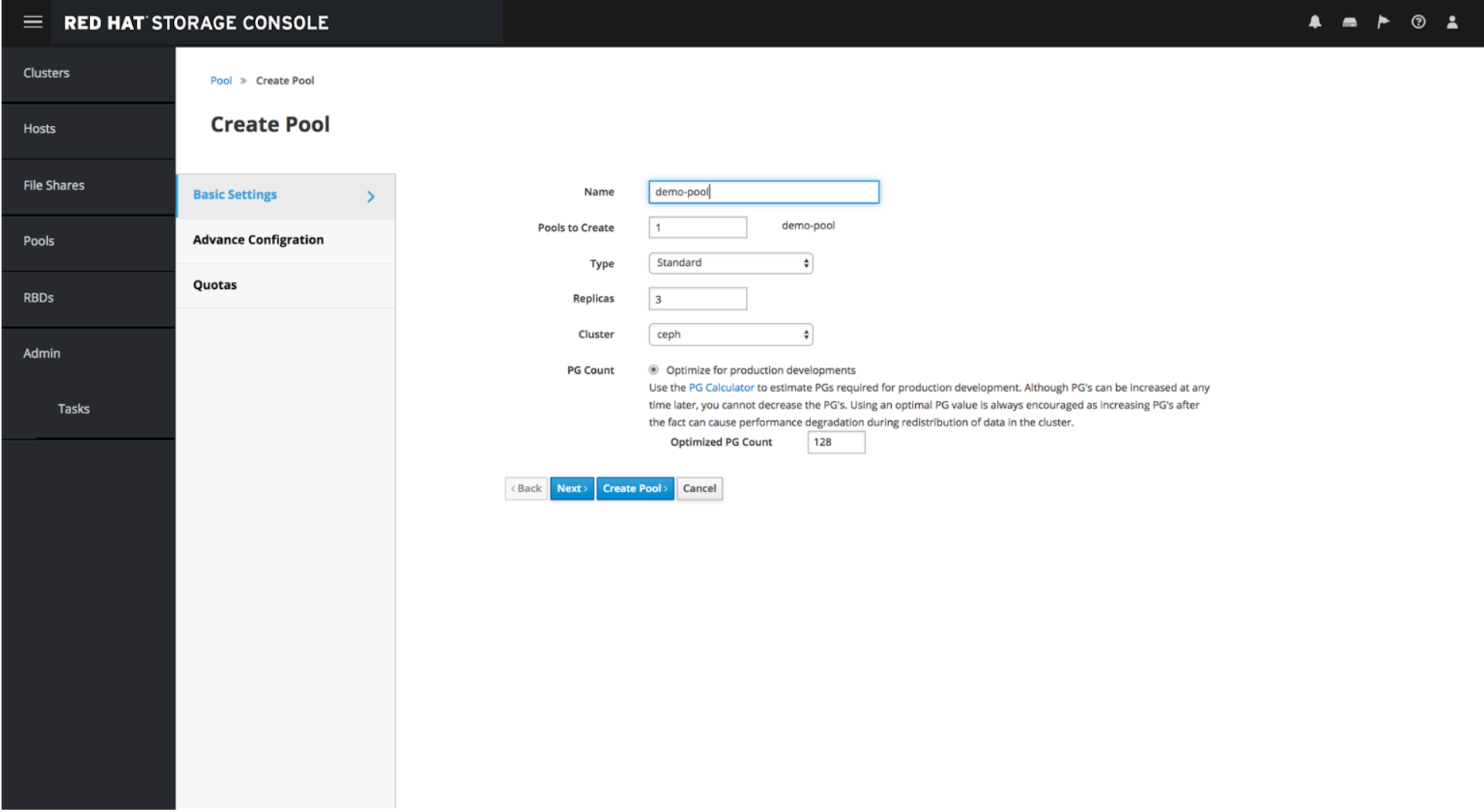

RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
Tasks
Tasks » CreateCluster: ecf9a9a1-bf1e-49d7-b777-32ea2c11a696
Task history
Time Submitted: 19 Apr 2017
Status: Finished
Events
info Processing Job ecf9a9a1-bf1e-49d7-b777-32ea2c11a696
info Running Flow tendrl.flows.CreateCluster
info Created SSH setup job 882101ba-fa00-434b-b8d4-15a0fb200d73 for node cb819b40-ec42-40a8-bef5-797e4a304dd2
info Created SSH setup job a5e71a91-0121-4018-80f4-e2c1dc959c28 for node 20047220-9edf-4916-9cc7-c4d86257f8d4
info Processing Job a5e71a91-0121-4018-80f4-e2c1dc959c28
info Running Flow tendrl.flows.SetupSsh
info JOB[a5e71a91-0121-4018-80f4-e2c1dc959c28]: Finished Flow tendrl.flows.SetupSsh
info Created SSH setup job 941671e2-a06f-4b2e-be04-2e25b34390d1 for node 563498f2-29a7-4684-b27f-17ebfafa0d32
info Processing Job 882101ba-fa00-434b-b8d4-15a0fb200d73
info Running Flow tendrl.flows.SetupSsh
info Created SSH setup job e5fb2a47-0bc5-4dac-8572-0c24a24a1390 for node d173b0a3-7c54-4314-830f-2f4263875aab
info JOB[882101ba-fa00-434b-b8d4-15a0fb200d73]: Finished Flow tendrl.flows.SetupSsh
info Created SSH setup job 4381246d-719b-4272-b5db-dbfa597b3072 for node 96764bef-e956-458b-bdd1-a3ca88620597
info SSH setup completed for all nodes in cluster bfcea228-e01c-473a-9493-045cb4862c16

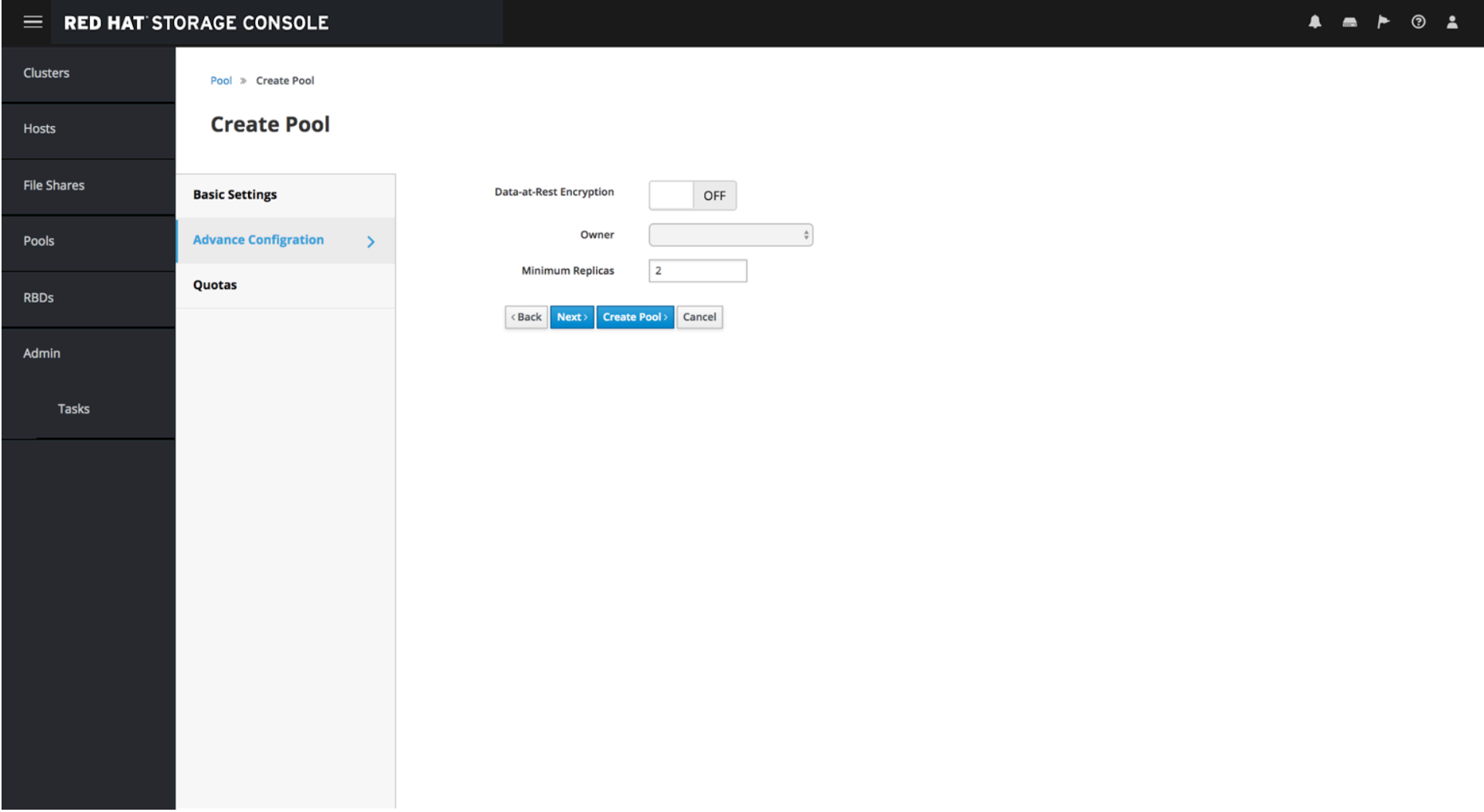

RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
Tasks
Hosts
Name
Filter By name...
Name
9 Hosts
dhcp43-44.lab...
4%
Storage
1.6 GB
of 35.5 GB
used
39%
CPU
39 %
used
24%
Memory
217.9 MB
of 990.7
MB used
Cluster
...
Role
OSD
Host
Alerts
0
dhcp43-45.lab...
8%
Storage
1.6 GB
of 17.2 GB
used
21%
CPU
21 %
used
13%
Memory
251.1 MB
of 1.8 GB
used
Cluster
...
Role
Peer
Alerts
0
dhcp43-46.lab...
4%
Storage
1.6 GB
of 15.5 GB
used
39%
CPU
39 %
used
13%
Memory
218.2 MB
of 990.7
MB used
Cluster
...
Role
Peer
Alerts
0
dhcp43-47.lab...
8%
Storage
1.5 GB
of 17.2 GB
used
20%
CPU
20 %
used
13%
Memory
252.2 MB
of 1.8 GB
used
Cluster
...
Role
Peer
Alerts
0
dhcp43-54.lab...
11%
Storage
1.9 GB
of 15.5 GB
used
45%
CPU
45 %
used
24%
Memory
238.1 MB
of 990.7
MB used
Cluster
...
Role
Monitor
Alerts
0
dhcp43-55.lab...
8%
Storage
1.6 GB
of 17.2 GB
used
32%
CPU
32 %
used
22%
Memory
218.2 MB
of 990.7
MB used
Cluster
...
Role
OSD
Host
Alerts
0

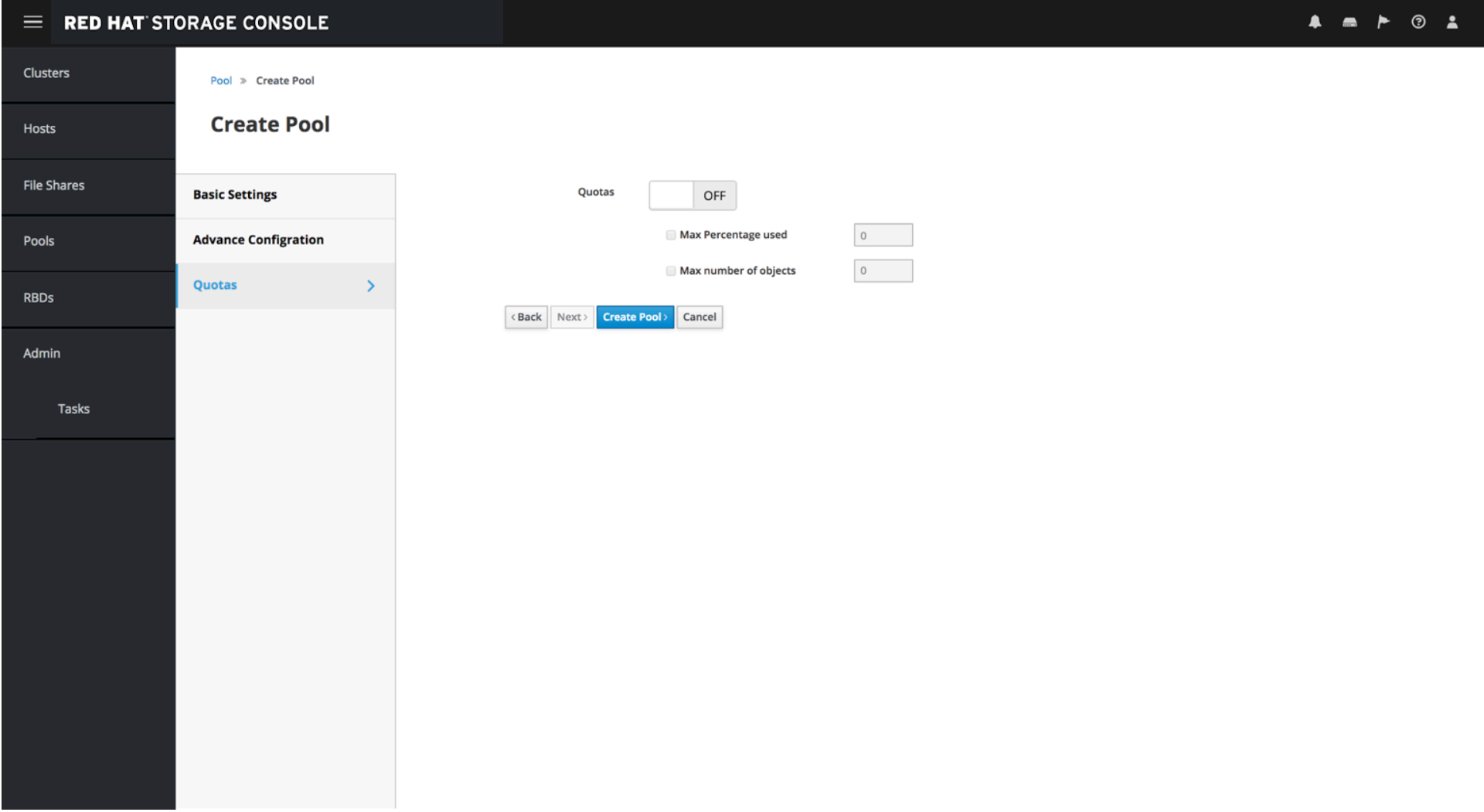

RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
File Shares
Name
Filter By name...
Name
No File Shares Detected
If no File Shares are detected after creating or importing a Gluster cluster, reconfigure the File Shares correctly.

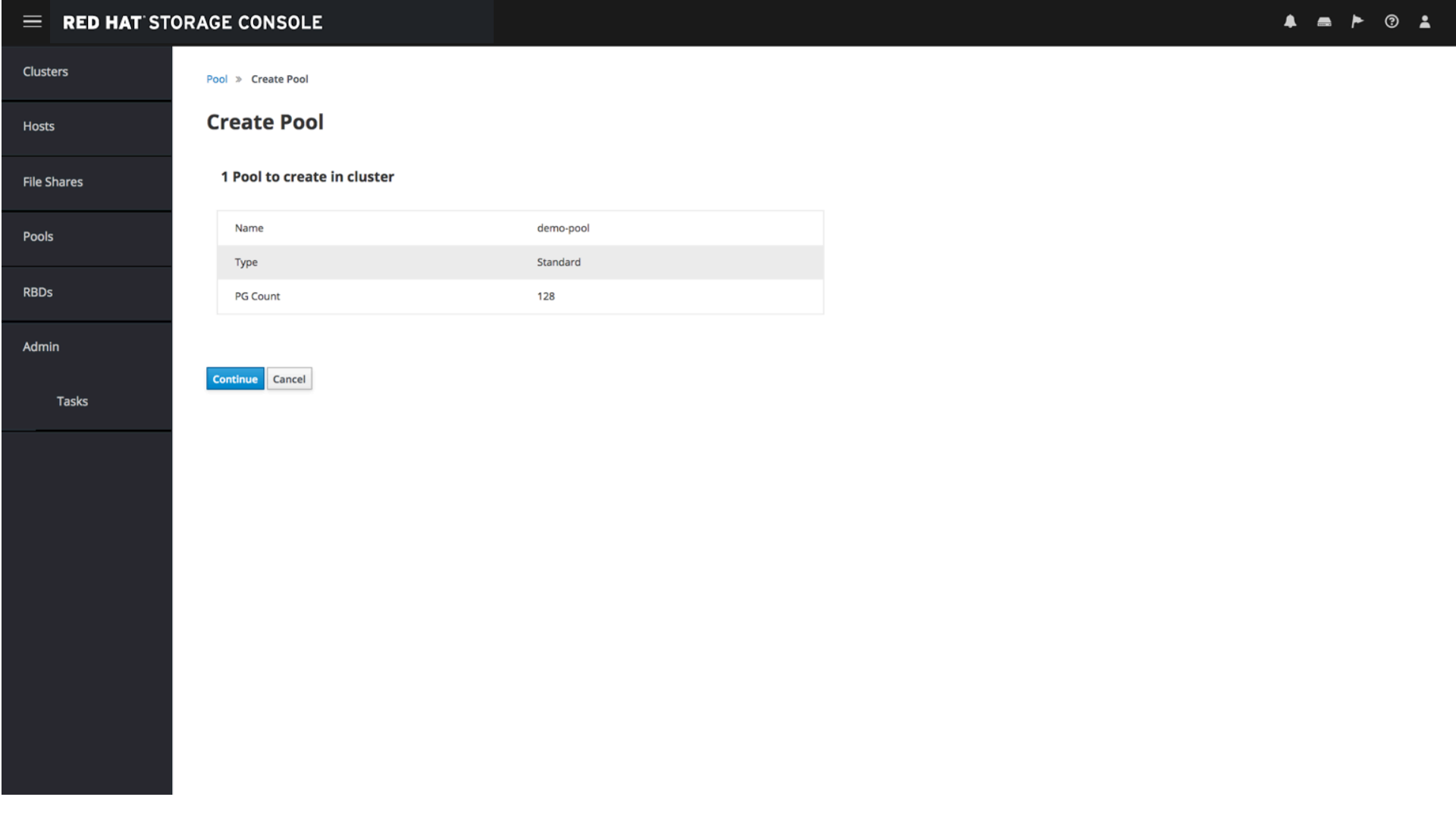

RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
Pools
Name
Filter By name...
Name
Create
7 Pools
Jeffallinone In Ceph
Replicated
0%
Storage
0 %
used
Replicas
3
OSD
NA
PGs
128
Quotas
Disabled
Alerts
NA
Edit
Grow PGs
Remove
JeffBPool In Ceph
Replicated
0%
Storage
0 %
used
Replicas
3
OSD
NA
PGs
128
Quotas
Disabled
NA
Jpool In Ceph
Replicated
0%
Storage
0 %
used
Replicas
3
OSD
NA
PGs
192
Quotas
30%
Alerts
NA
Ju-Ec-Pool In Ceph
Erasure Coded
0%
Storage
0 %
used
EC Profile
2+1
OSD
NA
PGs
32
Quotas
Disabled
Alerts
NA
Jupool In Ceph
Replicated
0%
Storage
0 %
used
Replicas
2
OSD
NA
PGs
64
Quotas
Disabled
Alerts
NA
MyPool In Ceph
Replicated
0%
Storage
0 %
used
Replicas
3
OSD
NA
PGs
129
Quotas
Disabled
Alerts
NA
Rbd In Ceph
Replicated
0%
Storage
0 %
used
Replicas
3
OSD
NA
PGs
128
Quotas
Disabled
Alerts
NA

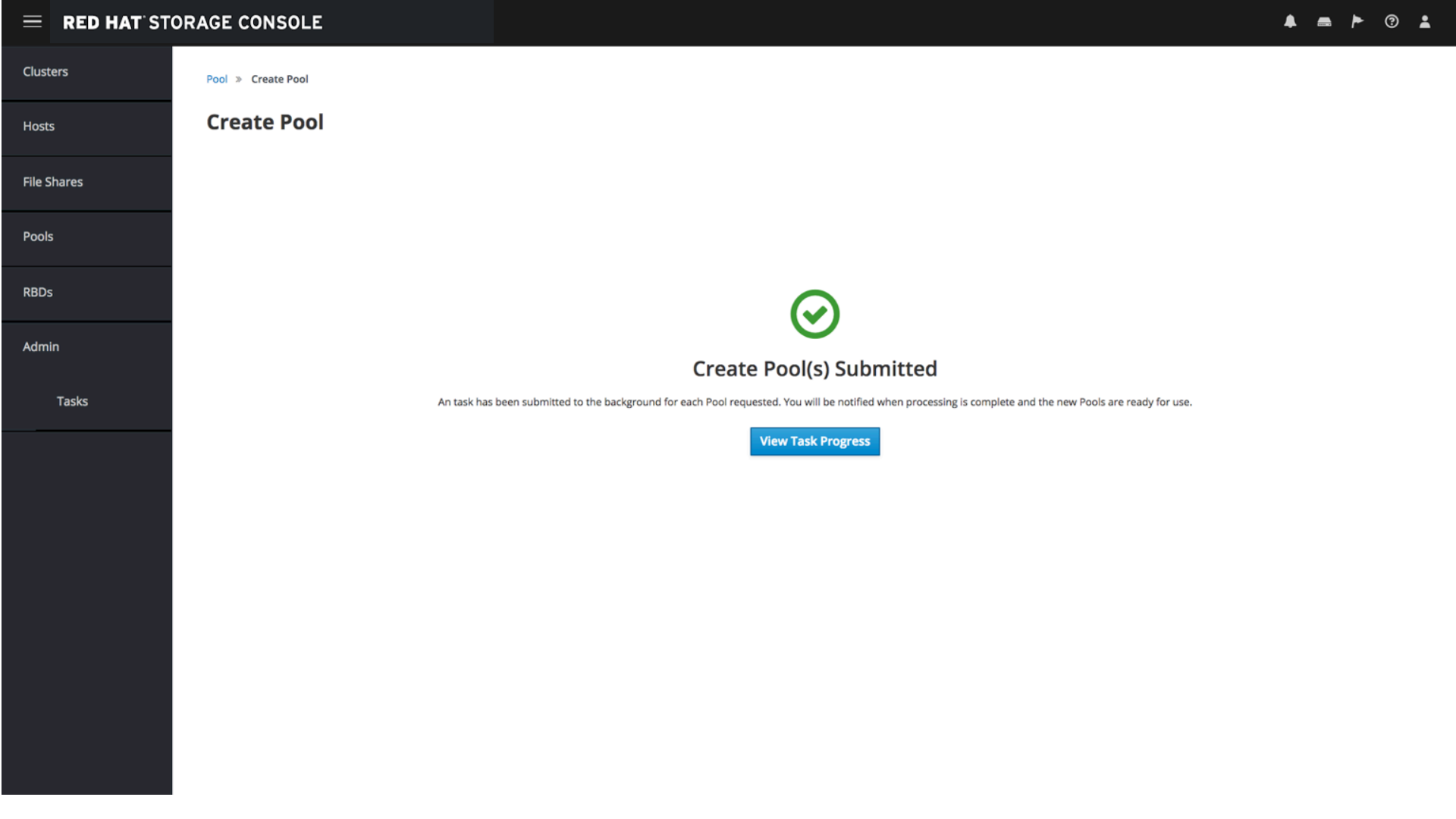
Now Let’s Create a Ceph Storage Pool...


RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
Tasks
Pool » Create Pool
Create Pool
Basic Settings
Advance Configration
Quotas
Name
demo-pool
Pools to Create
1
demo-pool
Type
Standard
Replicas
3
Cluster
ceph
PG Count
Optimize for production developments
Use the PG Calculator to estimate PGs required for production development. Although PG's can be increased at any time later, you cannot decrease the PG's. Using an optimal PG value is always encouraged as increasing PG's after the fact can cause performance degradation during redistribution of data in the cluster.
Optimized PG Count
128
Back
Next
Create Pool
Cancel

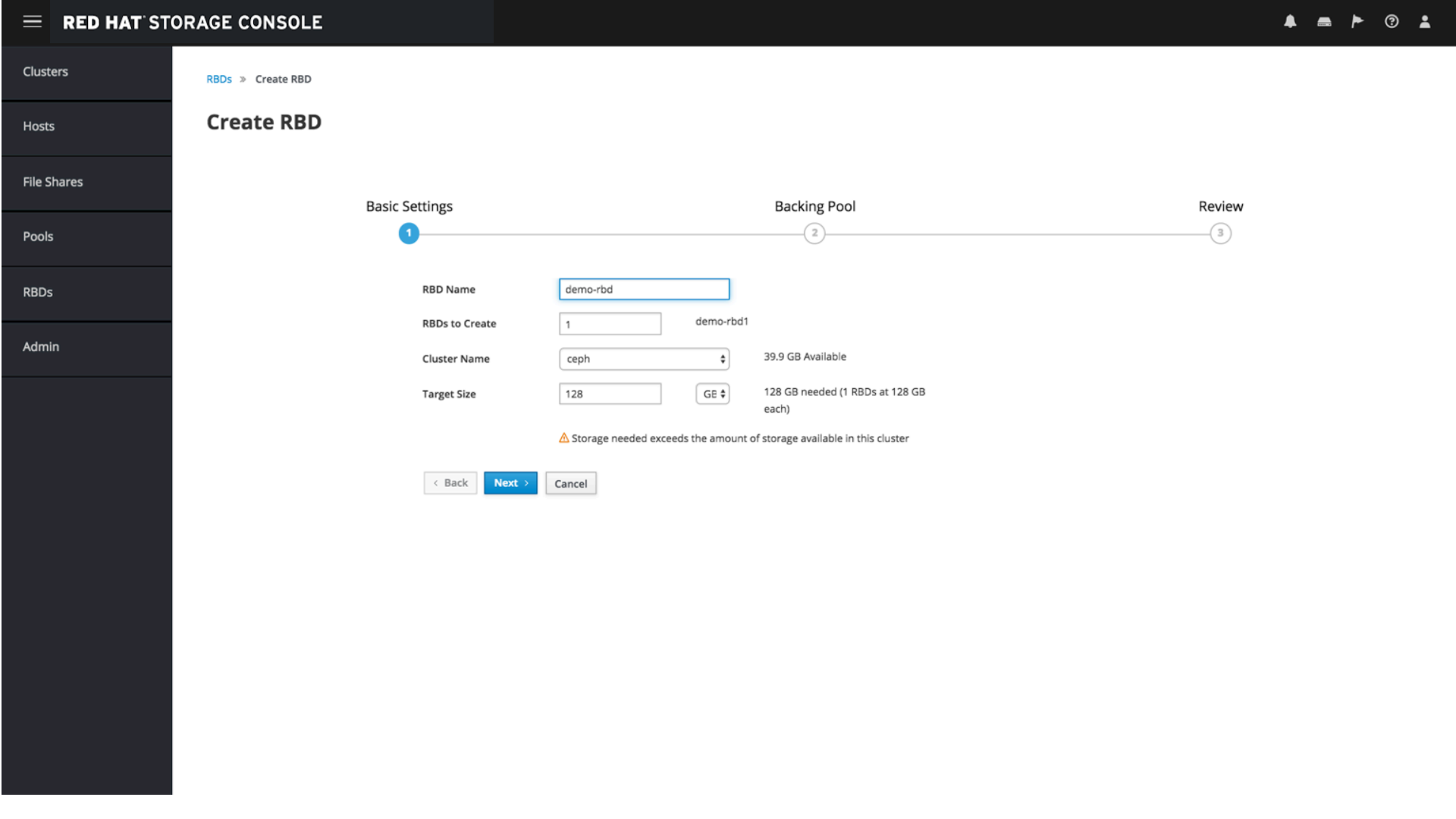

RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
Tasks
Pool » Create Pool
Create Pool
Basic Settings
Advance Configration
Quotas
Data-at-Rest Encryption
OFF
Owner
Minimum Replicas
2
‹ Back
Next ›
Create Pool ›
Cancel

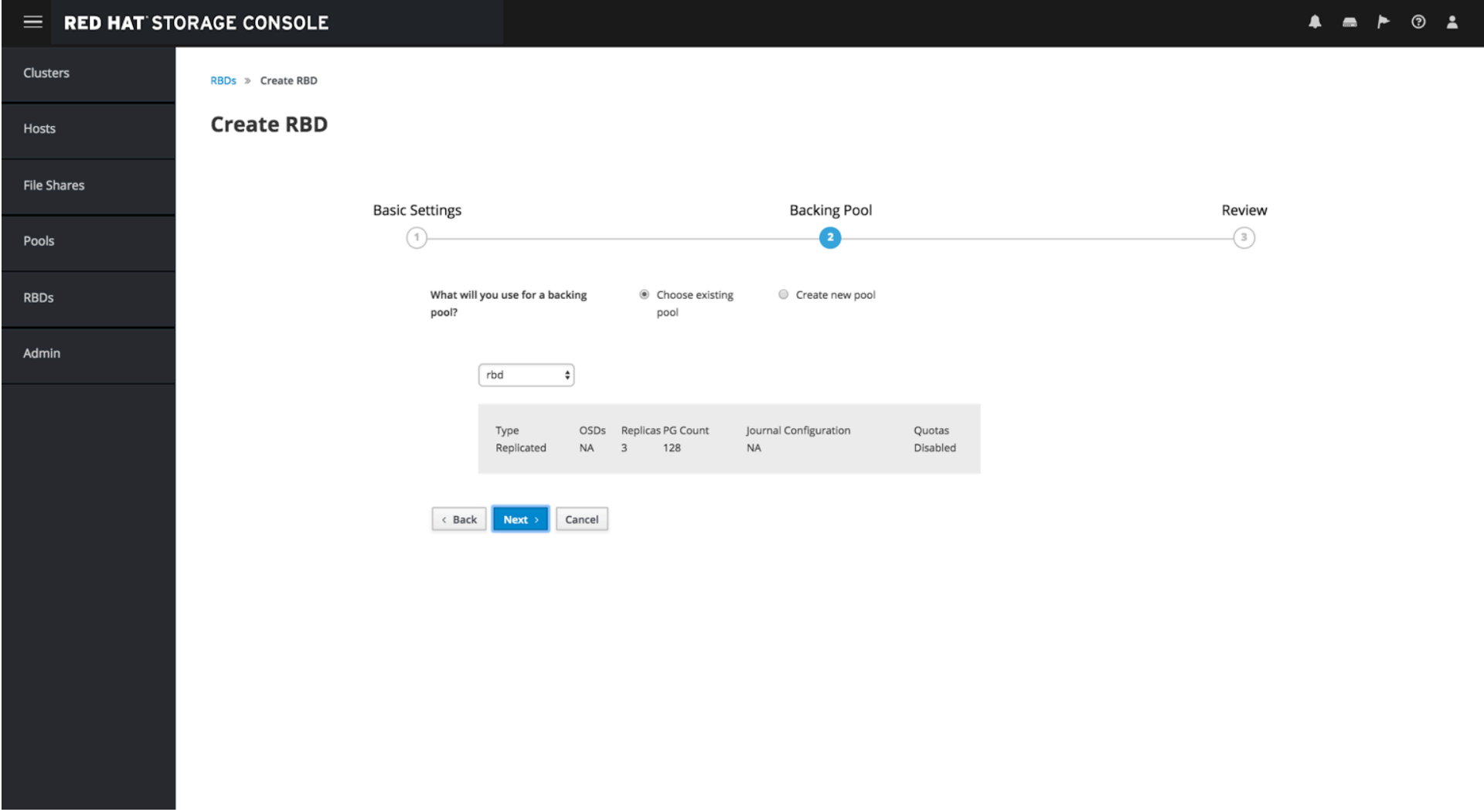

RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
Tasks
Pool » Create Pool
Create Pool
Basic Settings
Advance Configration
Quotas
Quotas
OFF
Max Percentage used
0
Max number of objects
0
‹ Back
Next ›
Create Pool ›
Cancel

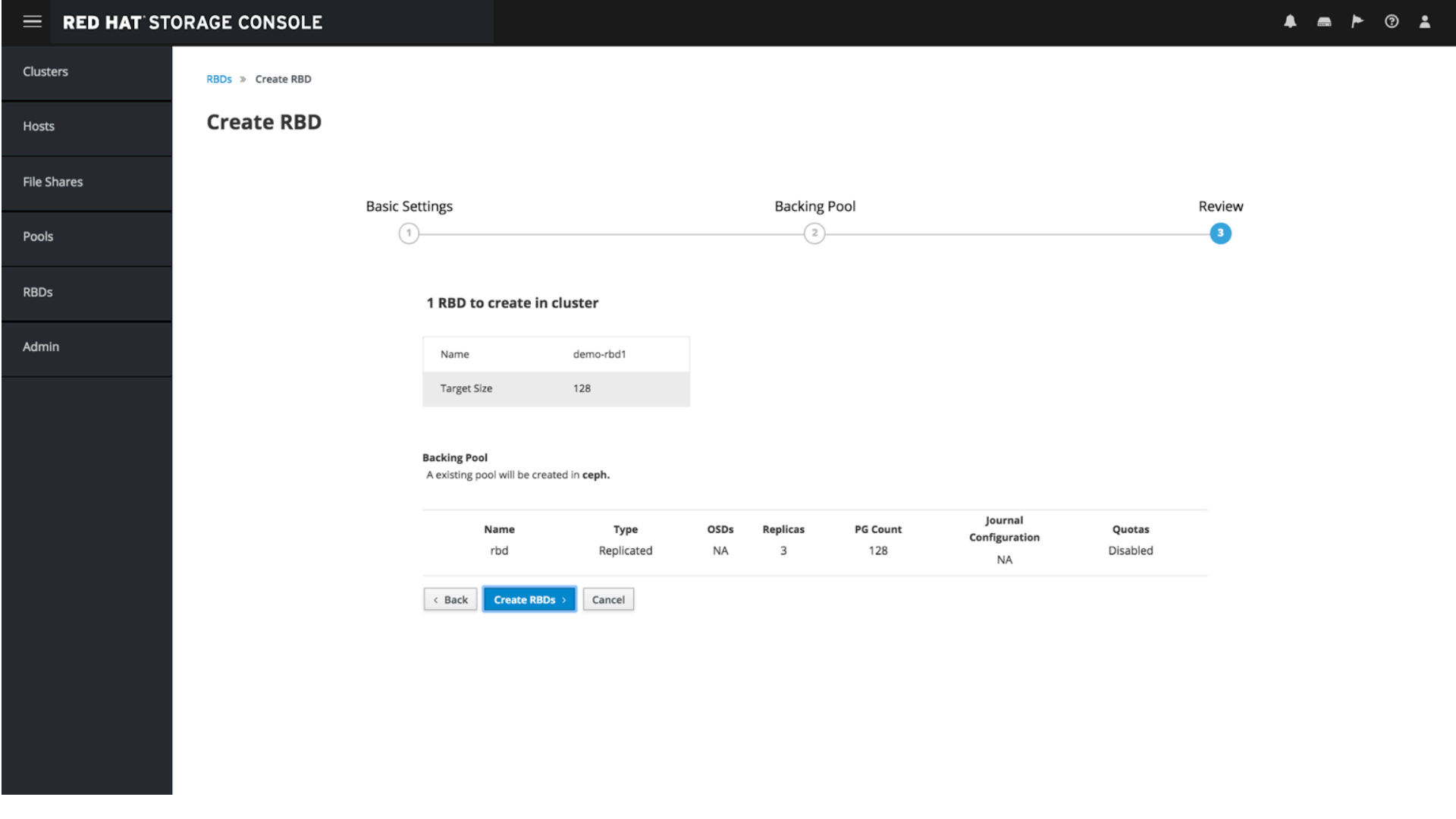

RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
Tasks
Pool » Create Pool
Create Pool
1 Pool to create in cluster
Name
demo-pool
Type
Standard
PG Count
128
Continue
Cancel


RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
Tasks
Pool » Create Pool
Create Pool
Create Pool(s) Submitted
An task has been submitted to the background for each Pool requested. You will be notified when processing is complete and the new Pools are ready for use.
View Task Progress

Now Let’s Create a Ceph RADOS Block Device...


RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
RBDs » Create RBD
Create RBD
Basic Settings
Backing Pool
Review
1
2
3
RBD Name
demo-rbd
RBDs to Create
1
demo-rbd1
Cluster Name
ceph
39.9 GB Available
Target Size
128
GB
128 GB needed (1 RBDs at 128 GB each)
Storage needed exceeds the amount of storage available in this cluster
Back
Next
Cancel


RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
RBDs » Create RBD
Create RBD
Basic Settings
Backing Pool
Review
1
2
3
What will you use for a backing pool?
Choose existing pool
Create new pool
rbd
Type
Replicated
OSDs
NA
Replicas
3
PG Count
128
Journal Configuration
NA
Quotas
Disabled
Back
Next
Cancel


RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
RBDs » Create RBD
Create RBD
Basic Settings
Backing Pool
Review
1
2
3
1 RBD to create in cluster
Name
demo-rbd1
Target Size
128
Backing Pool
A existing pool will be created in ceph.
Name
Type
OSDs
Replicas
PG Count
Journal Configuration
Quotas
rbd
Replicated
NA
3
128
NA
Disabled
Back
Create RBDs
Cancel

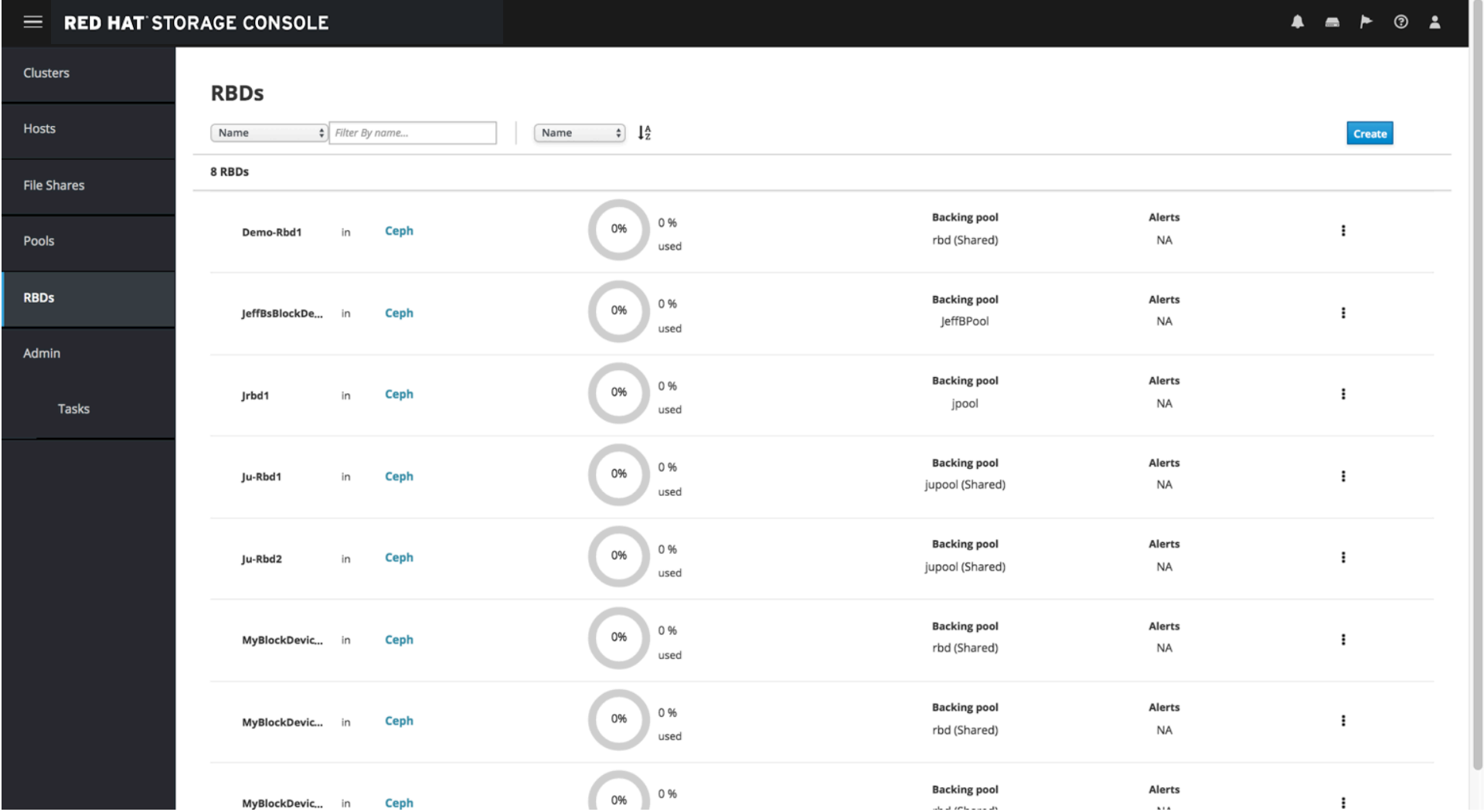
Clusters
Hosts
File Shares
Pools
RBDs
Admin

Create RBD

Create RBD(s) Submitted

An task has been submitted to the background for each RBD requested. You will be notified when processing is complete and the new RBDs are ready for use.

View Task Progress


RED HAT STORAGE CONSOLE
Clusters
Hosts
File Shares
Pools
RBDs
Admin
Tasks
RBDs
Name
Filter By name...
Name
Create
8 RBDs
Demo-Rbd1 in Ceph 0% 0 % used Backing pool rbd (Shared) Alerts NA
JeffBsBlockDe... in Ceph 0% 0 % used Backing pool JeffBPool Alerts NA
Jrbd1 in Ceph 0% 0 % used Backing pool jpool Alerts NA
Ju-Rbd1 in Ceph 0% 0 % used Backing pool jupool (Shared) Alerts NA
Ju-Rbd2 in Ceph 0% 0 % used Backing pool jupool (Shared) Alerts NA
MyBlockDevic... in Ceph 0% 0 % used Backing pool rbd (Shared) Alerts NA
MyBlockDevic... in Ceph 0% 0 % used Backing pool rbd (Shared) Alerts NA
MyBlockDevic... in Ceph 0% 0 % Backing pool Alerts

Clusters
Hosts
File Shares
Pools
RBDs
Admin
Tasks

Tasks

Name | Filter By flow... | From: | To:

Show: In progress | Succeeded | Failed

31 Tasks

✓	**CreateRbd** Task ID: f9adca34-ad4d-4f79-b53e-1549581793c8	**Submitted** 28 Apr 2017 16:16:09	**Completed**
✓	**CreatePool** Task ID: 154e557c-bf4f-4576-9867-2227085f0c67	**Submitted** 28 Apr 2017 15:44:12	**Completed**
✓	**CreateRbd** Task ID: eae0a19b-8c7c-4262-a978-7f23f4adbbc4	**Submitted** 28 Apr 2017 07:45:29	**Completed**
✓	**CreateRbd** Task ID: 557c0af2-d2a3-4fad-b42c-8dd0ca2d35fa	**Submitted** 28 Apr 2017 07:45:28	**Completed**
✗	**CreateRbd** Task ID: 8652f92f-b73d-463b-9935-8397f089fd33	**Submitted** 28 Apr 2017 07:45:28	**Failed**
✗	**CreatePool** Task ID: 169d5fad-8400-41bc-9bda-58eb0d42d9d5	**Submitted** 28 Apr 2017 07:45:09	**Failed**
✓	**CreatePool** Task ID: 37b6a069-92db-458c-b018-afb39aecde08	**Submitted** 26 Apr 2017 07:02:34	**Completed**
✗	**CreatePool** Task ID: 7fe5a3fa-f821-4379-b824-4bca0a8a9388	**Submitted** 26 Apr 2017 03:52:20	**Failed**
✗	**CreatePool** Task ID: 8610fa19-3894-42dd-ac57-ead79ebdc739	**Submitted** 26 Apr 2017 03:43:06	**Failed**
✓	**CreatePool**	**Submitted**	**Completed**

Road Map

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RHS-C ROADMAP SUMMARY

RED HAT STORAGE CONSOLE (past)

RHSC 1.0 (2013)
- Gluster Support
- Provisioning
- Monitoring, Dashboard
- EoL (support extended)

RHS-C 2.0 (Aug 2016)
- Ceph 2.0 Support
- Provisioning
- Monitoring, Dashboard
- 2 Async releases
- EoL Feb 2018

RED HAT STORAGE CONSOLE (2017 & beyond)

RHS-C 3 (early Fall 2017)
- Gluster 3.2 Support (MVP)
- Ceph 2.x Support
- RHS Console 2 Equivalency for Gluster
- Improved Dashboard

RHS-C 4 (Spring 2018)
- Gluster add Vol types, Tiering, Data Management, CIFS/ NFS
- Snapshots, Geo-replication
- Ceph RGW, CRUSH map visualization
- RH Insights & Analytics

RHS-C 5 (Fall 2018)
- Gluster: Emerging features*
- CephFS enablement
- Ceph advanced troubleshooting, RBD Top, analytics
- RH Portfolio Enablement

UPSTREAM ACTIVITY (Past & Future)

Tendrl 1.0 (Nov 14)
- Framework creation

Tendrl 2.0 (May 18)
- Ceph + Gluster MVP

Tendrl 3.0 (Aug 2017)
- Gluster EC, Gluster provisioning

Red Hat Storage Console 4

Targeted for Spring 2018

Snapshot Functionality for Gluster Volumes and Ceph RBD

Gluster: Volume types (Sharded, Striped, Tiering), Data Management, Geo-replication, CIFS/ NFS enablement

Snapshots, Ceph: Add RADOS Gate

Ceph CRUSH Map visualization

Auto re-weight? *under investigation.*

Export to EFK (Elastic Search, FluentD, Kibana)? *under investigation*

Red Hat Storage Console 4

With Red Hat Insights & Analytics

Predictive analytics

This helps you save time and money addressing problems after the fact. Red Hat Insights lets you know about problems **before** they affect your environment.

Reduce human error, resolve quickly: Our Storage experts prepare the solution articles.

See potential problems and issues in real-time, without the need to wait for reactive error reports and logs, then fix with ease.

Better, faster, and stronger through experience

Red Hat Storage Console 5

Targeted for Fall 2018

Gluster: Emerging features - Compression, QoS

Ceph advanced troubleshooting, “RBD Top”, analytics

Ceph CRUSH editor

CephFS Enablement

Red Hat CloudForms: Basic storage reporting, show back / chargeback, cross linking

If you have product ideas or requests

Contact me! japplewh@redhat.com

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