Red Hat Ceph Storage: Building an Object Storage Active/Active Multi-site Solution

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05-08-19
STORAGE FOR THE OPEN HYBRID CLOUD

OPENSHIFT CONTAINER STORAGE
COMPLETE DATA PORTABILITY
For OpenShift Across the Hybrid Cloud

HYBRID CLOUD OBJECT STORAGE
MOST SCALABLE DATA PLATFORM
For Data Analytics, AI/ML, and emerging workloads

HYPERCONVERGENCE
ELASTIC INFRA ACROSS THE DATA CENTER AND EDGE
Built to enable flexibility, scale, and ease of use
AGENDA

1. Introduction
3. Red Hat Ceph Rados Gateway Multi-Site use cases.
4. Goals of the Lab
5. Lab description
6. Environment Access
7. Lab conclusions
8. Q&A
RHCS INTRODUCTION & ARCHITECTURE
Red Hat Ceph Storage Introduction

- Open source project more than 10 years ago
- Unified Software Defined Storage
- No Single Point Of Failure
- Horizontal scaling
- Self-managing/healing
- Hardware agnostic, runs on *commodity* hardware
ARCHITECTURAL COMPONENTS

APP

RGW
A web services gateway for object storage, compatible with S3 and Swift

HOST/VM

RBD
A reliable, fully-distributed block device with cloud platform integration

CLIENT

CEPHFS
A distributed file system with POSIX semantics and scale-out metadata management

LIBRADOS
A library allowing apps to directly access RADOS (C, C++, Java, Python, Ruby, PHP)

RADOS
A software-based, reliable, autonomous, distributed object store comprised of self-healing, self-managing, intelligent storage nodes and lightweight monitors
THE RADOS GATEWAY

Rados Cluster

RADOSGW
LIBRADOS

APPLICATION

RADOSGW
LIBRADOS

APPLICATION

REST

socket

RADOS CLUSTER
RADOS GATEWAY MULTISITE USE CASES
WEB APPLICATION STORAGE

WEB APPLICATION

APP SERVER

S3/Swift

CEPH OBJECT GATEWAY (RGW)

CEPH STORAGE CLUSTER (RADOS)

WEB APPLICATION

APP SERVER

S3/Swift

CEPH OBJECT GATEWAY (RGW)

APP SERVER

S3/Swift

CEPH OBJECT GATEWAY (RGW)

APP SERVER

S3/Swift
MULTI-SITE OBJECT STORAGE

WEB APPLICATION
   APP SERVER

CEPH OBJECT GATEWAY (RGW)

CEPH STORAGE CLUSTER (US-EAST)

Replication

WEB APPLICATION
   APP SERVER

CEPH OBJECT GATEWAY (RGW)

CEPH STORAGE CLUSTER (EU-WEST)
GOALS OF THE LAB
Goals of this RH Summit Lab

- Have a better understanding of Red Hat Ceph Storage architecture and concepts.
- Get a taste of installing, setting up and provisioning a containerized Red Hat Ceph deployment.
- Take a peek into Red Hat Ceph Storage metrics solution, included by default in the product.
- Enhance your skills building a Red Hat Ceph Storage Rados Gateway Multi-Site cluster.
- Learn how to configure a S3 client to validate and troubleshoot newly deployed RadosGW clusters.
LAB DESCRIPTION
LAB INTRO

- We will follow a variety of scenarios, to finally achieve the final result:
  - Two Ceph clusters (DC1 & DC2) deployed and configured for Object Storage with multi-site replication.

- At high level you would need to:
  - Deploy DC2 Ceph cluster, configure RGWs in both clusters, configure multi-site replication, configure Ceph metrics in DC2 and finally tests that everything works by creating and managing buckets and objects.
LAB SCENARIOS

1. Install and configure a Ceph cluster in DC2
2. Configure RGWs in both Ceph clusters DC1 & DC2
3. Configure RGWs Active-Active Multi-site replication
4. Configure an S3 client
5. Configure Ceph metrics in Ceph cluster DC2
6. Use S3 policies to Give external users access buckets [OPTIONAL]
LAB INTRO - TOOLS

- Tools used during the Lab:
  - ceph-ansible (Ceph installer)
  - ceph-metrics (Ceph metrics collectors & dashboards)
  - HAProxy LBs (To balance RGWs)
  - s3cmd (S3 API client)
LAB INTRO - PHYSICAL ARCH

Ceph Cluster - DC1 environment

Public Network DC1 [HTTP]

Ceph Cluster Network DC1

Active/Active replication (async)

Ceph Cluster Network DC2

Public Network DC2 [HTTP]

Ceph Cluster - DC2 environment

#redhat #rhsummit
LAB INTRO - LOGICAL ARCH
ENVIRONMENT ACCESS
ENVIRONMENT ACCESS


Activation Key: green

ssh-user-to-bastion: lab-user
ssh-user-from-bastion-to-nodes: cloud-user (ex: ssh cloud-user@cepha)

ssh into bastion: 'ssh bastion-<GUID>.rhpds.opentlc.com'

!!!!!SSH connection from your laptop to your bastion is already configured!!!!
*** THIS IS THE UAT ENVIRONMENT - FOR TESTING ONLY ***

Please choose the lab code for this session, enter the activation key, and your e-mail address then click Submit.

- **Lab Code:** T16808 - Red Hat Ceph Storage: Building an Object Storage Active/Active Multi-site Solution
- **Activation Key:**
- **E-Mail Address:**

- Unless your event organizer says otherwise, we will not e-mail you and your e-mail address will be deleted from this system after this session is over. Normally it is only used for tracking this session.
- You may need to refresh this page if you do not see an option for this lab session in the dropdown.
- If you are unsure which lab code to choose or what the activation key is please notify a lab assistant.

Submit

*** THIS IS THE UAT ENVIRONMENT - FOR TESTING ONLY ***
DC1 has the following VMs:

- 1 HAProxy node:
  - Hostname: lbdc1.summit.lab
    - IP: 10.0.0.100

- 3 Ceph nodes:
  - Hostname: ceph.a.summit.lab
    - IP: 10.0.0.11
  - Hostname: ceph.b.summit.lab
    - IP: 10.0.0.12
  - Hostname: ceph.c.summit.lab
    - IP: 10.0.0.13

- 1 Cephmetrics node:
  - Hostname: metricsd.summit.lab
    - IP: 10.0.0.14

LAB VMs

You can ssh using the shortname!

DC2 has the following VMs:

- 1 HAProxy node:
  - Hostname: lbdc2.summit.lab
    - IP: 172.16.0.100

- 3 Ceph nodes:
  - Hostname: ceph1.summit.lab
    - IP: 172.16.0.11
  - Hostname: ceph2.summit.lab
    - IP: 172.16.0.12
  - Hostname: ceph3.summit.lab
    - IP: 172.16.0.13

- 1 Cephmetrics node:
  - Hostname: metrics4.summit.lab
    - IP: 172.16.0.14
ENVIRONMENT ACCESS - TEST IT!!

1. ssh into your bastion:
   a. 'ssh bastion-<GUID>.rhpds.opentlc.com'

2. From your bastion, ssh into a DC1 ceph node:
   a. ssh cloud-user@ceph

3. From your bastion, ssh into a DC2 ceph node:
   a. ssh cloud-user@ceph2

4. Test Ceph metrics URL in DC1:
   b. User: admin
   c. Password: redhat01
LAB CONCLUSIONS
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- **Red Hat Ceph Storage**: Open, Scalable and Software Defined solution that provides Block, Object and Filesystem storage.

- **Ceph-ansible**: Centralized deployment and management tool for the clusters.

- **Ceph cluster with Active-Active Multisite**: Providing Failover and Disaster Recovery capabilities to the cluster for Object Storage use cases.

- **Red Hat Ceph Storage Dashboard (Ceph metrics)**: monitoring dashboard that uses Prometheus as data source and allows to the storage cluster state.
FIND US AT RED HAT SUMMIT

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- At the Red Hat booth
- At one of Storage dedicated sessions (red.ht/storageatsummit)
- At the Community Happy Hour (Tues 6:30, Harpoon Brewery)
- At the Hybrid Cloud Party (Wed, 7:30, “Committee” restaurant)

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THANK YOU

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FINAL TASK:

FILL IN EVALUATION FORM IN RED HAT SUMMIT APP, DO IT NOW!

Fill in: Red Hat Ceph Storage: Building an Object Storage Active Active Multi Site Solution

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