INSTALLATION RUNBOOK FOR Openwave Mobility + vUDR

Application Type:	**[Infrastructure (User data repository)]**
Application Version:	**[1.0]**
MOS Version:	**9.0**
OpenStack version:	**Mitaka**

Contents

Document History

Version	Revision Date	Description
0.1	01-08-2016	Initial Version

1 Introduction

This document is to serve as a detailed Deployment Guide for Openwave Mobility vUDR. This document describes the reference architecture, installation steps for Openwave Mobility vUDR, limitations and testing procedures.

1.1 Target Audience

This guide is designed for operators interested in evaluating the benefits of the OWM vUDR solution.

1.2 Why SDM?

Subscriber data management (SDM) is a mission critical system. Before any voice connection can be established, any data service accessed, or any message sent or received, internal systems need to authenticate a subscriber and their device to authorize the action the subscriber requests. For a communications network, SDM system is literally the life-giving oxygen. Services simply cannot be offered without authenticating the subscriber. SDM system serves as a foundation for other network applications like HSS, PCRF, Billing systems. As service providers move towards network function virtualization (NFV), it is imperative that this foundational block, i.e. SDM, is the first application that is deployed in the cloud. Also, the SDM system should be able to realize the benefits of virtualization like scale, elasticity, low OPEX, etc. without compromising on telco grade requirements of data integrity, high availability, reliability and performance.

2 Application overview

Today, service providers operate in multiple domains like mobility, triple play services (fixed line, broadband and cable TV), IOT, etc. Each of these domains has its own data stores, which are not accessible to applications from other domains. Even within the same domain, there is no unified data repository. Subscriber profile is fragmented across multiple silo'ed repositories. For instance, HSS has its own repository,
Result – data fragmentation, data duplication, data consistency issues, sub-optimal capacity utilization, high costs.

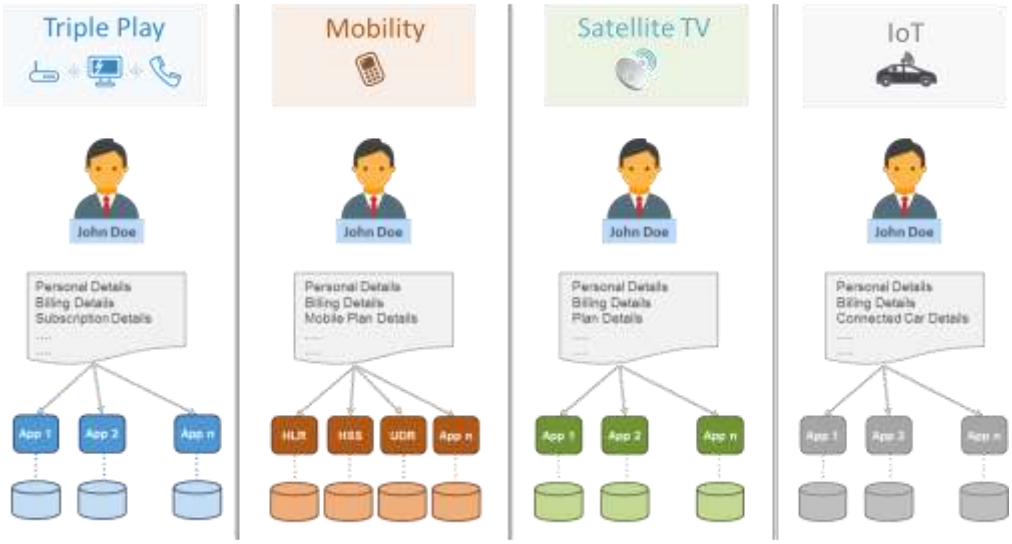


Figure 1 - One subscriber, many silos

vUDR addresses these issues by introducing a 3-teir architecture that provides a unified view of subscriber data, not only across multiple databases within a domain, but also across multiple domains. It is the industry's first, telco grade NFV based Subscriber Data Management (SDM) solution. It is a 3GPP standards compliant virtualized User Data Repository (vUDR) deployable in NFV environments which enables service providers to efficiently manage their capacities through dynamic scaling capabilities, reduce TCO and lessen time-to-market for new services by decoupling subscriber data from the application front end logic.

The consistency and availability of data can be configured on a per application level.
vUDR was designed with the cloud in mind and is horizontally scalable to facilitate capacity expansion on demand.
vUDR makes any data available, anywhere at any time. You provision once and it is both federated and distributed to provide optimal cost, performance and resiliency.

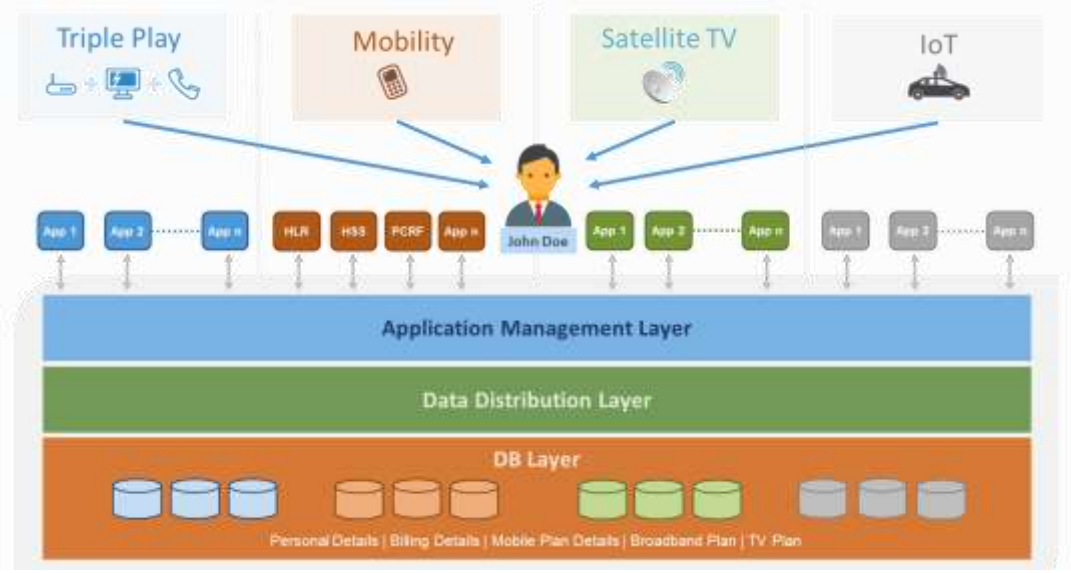


Figure 2 - Unified Profile Using Openwave Mobility vUDR

The Openwave Mobility vUDR solution provides:

Reduced OPEX

- Multiple data stores reduced to one
- COTS hardware
- Deployed in weeks

Extreme Agility

- Cloud-based elasticity
- No vendor lock-in – operator owned schema
- Decoupling of application management logic from storage logic

Telco Grade Availability

- Provides 5 nines of availability on commodity grade hardware based clouds.

3 Joint Reference Architecture

The vUDR is deployed as a cluster of VMs. It's optimized to run as a virtual solution, tested on Mirantis OpenStack 9.0.

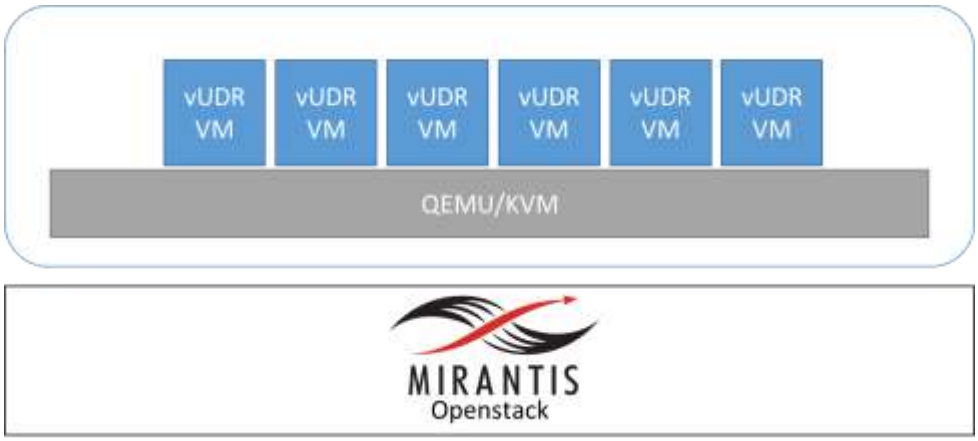


Figure 3 - vUDR Deployment on Mirantis OpenStack

4 Installation & Configuration

4.1 Environment preparation

The solution requires a standard installation of MOS 9.0. For optimal performance, it is recommended that you enable CPU pinning.

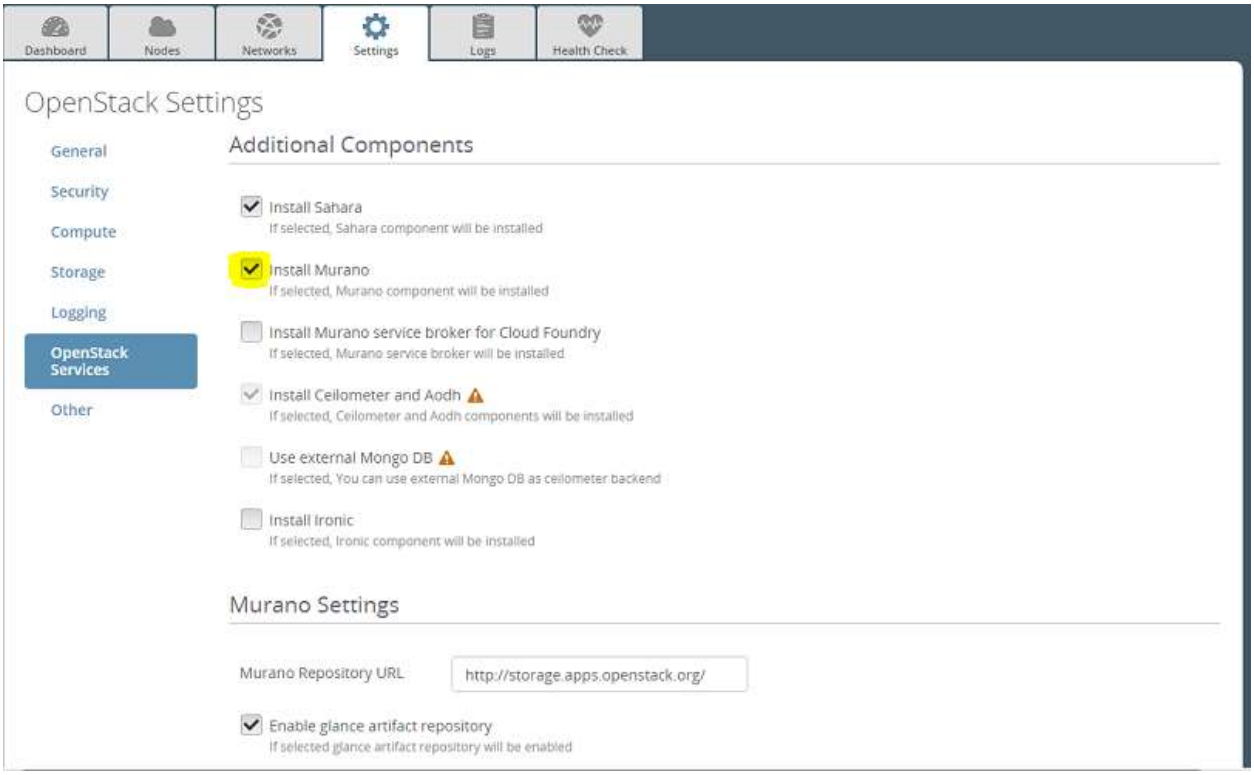
The solutions assume the use of bare-metal hypervisors configured with highly available network interfaces.

It is recommended to have multiple availability zones, in order to guarantee the high availability of your data.

4.2 MOS installation

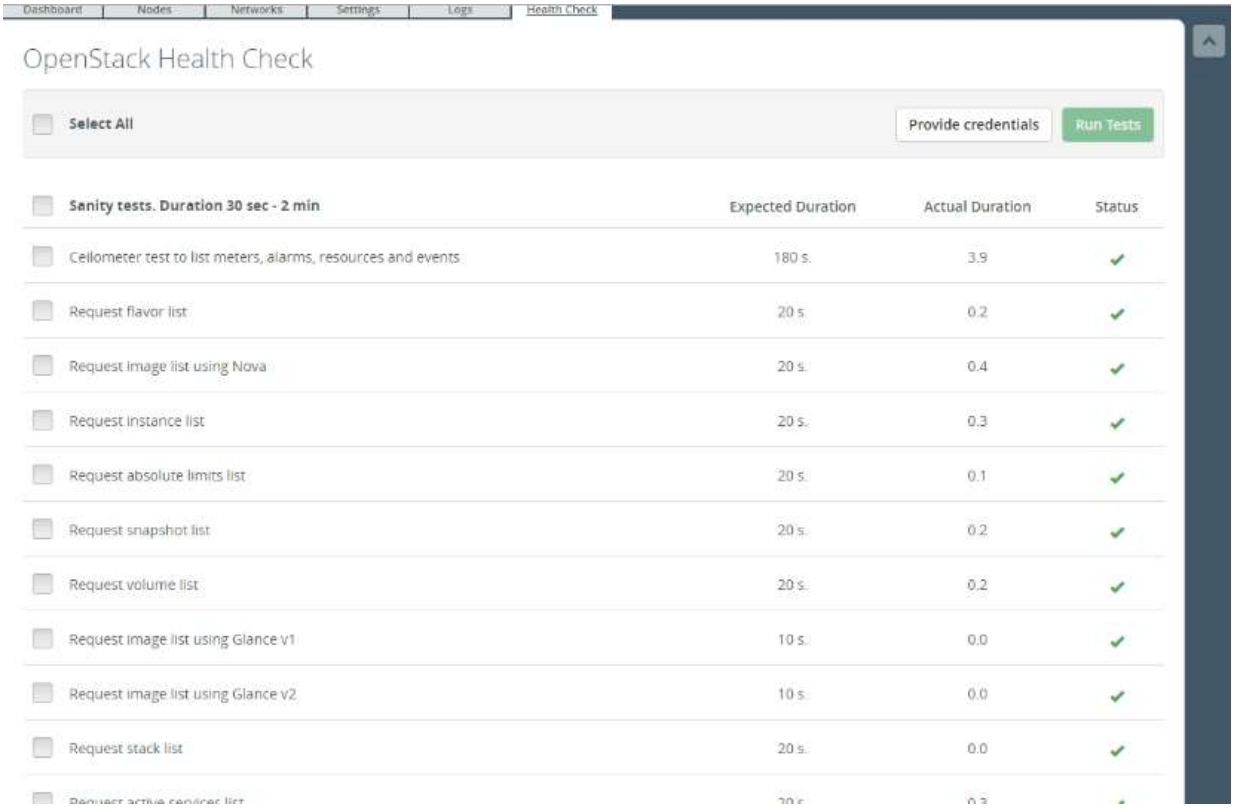
Install MOS per the Mirantis guidelines
https://docs.mirantis.com/openstack/fuel/fuel-9.0/quickstart-guide.html#introduction

While installing, please make sure that Murano is enabled in the Fuel settings as shown in the below screenshot.



4.2.1 Health Check Results

Run the health checks to verify the deployment is completed and running successfully.



Once everything looks ok OpenStack system health-wise, it is time to install vUDR.

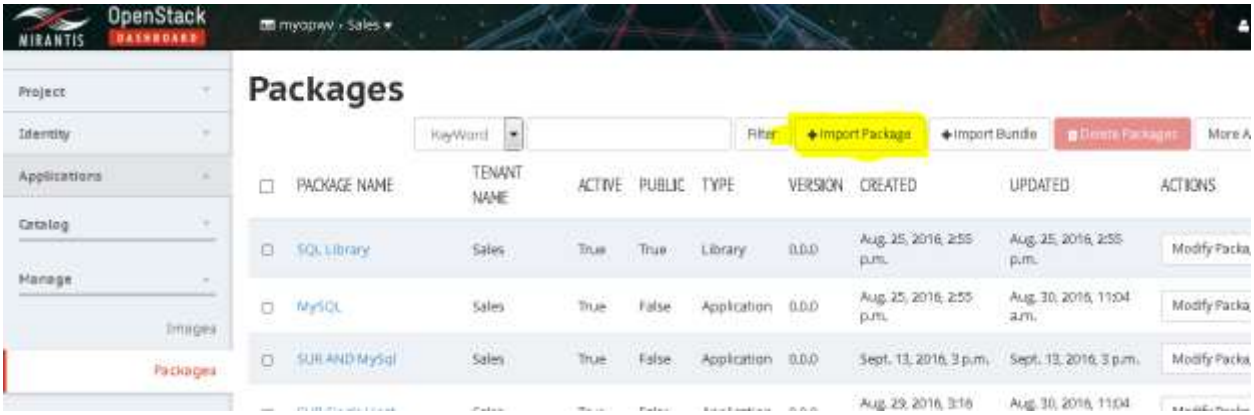
4.3 vUDR installation steps

The vUDR solution has been packaged for Murano. This provides a wizard driven deployment that instantiates a running vUDR ready to use. The following section describes the steps and options. As pre-requisite the deployment requires a RHEL 6.X with the pre-existing software dependencies. Contact your OWM representative to obtain the necessary images.

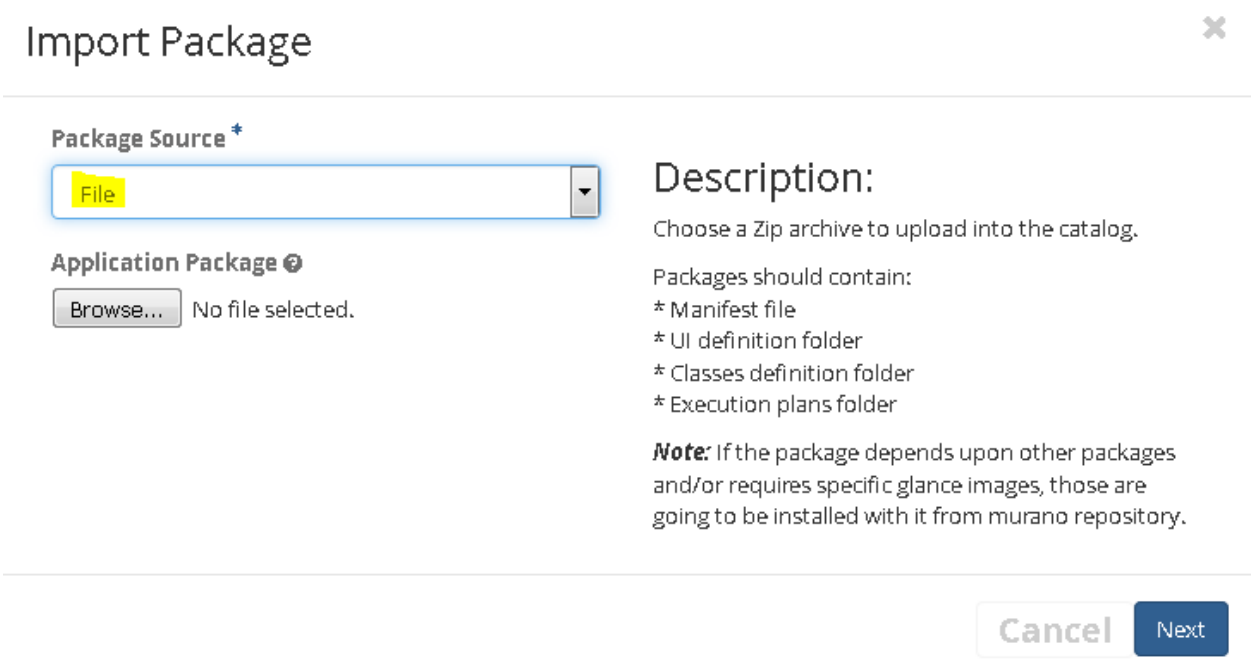
4.3.1 Steps for getting and importing vUDR Murano package

1. Get the Murano package for vUDR application by sending email to info@owmobility.com

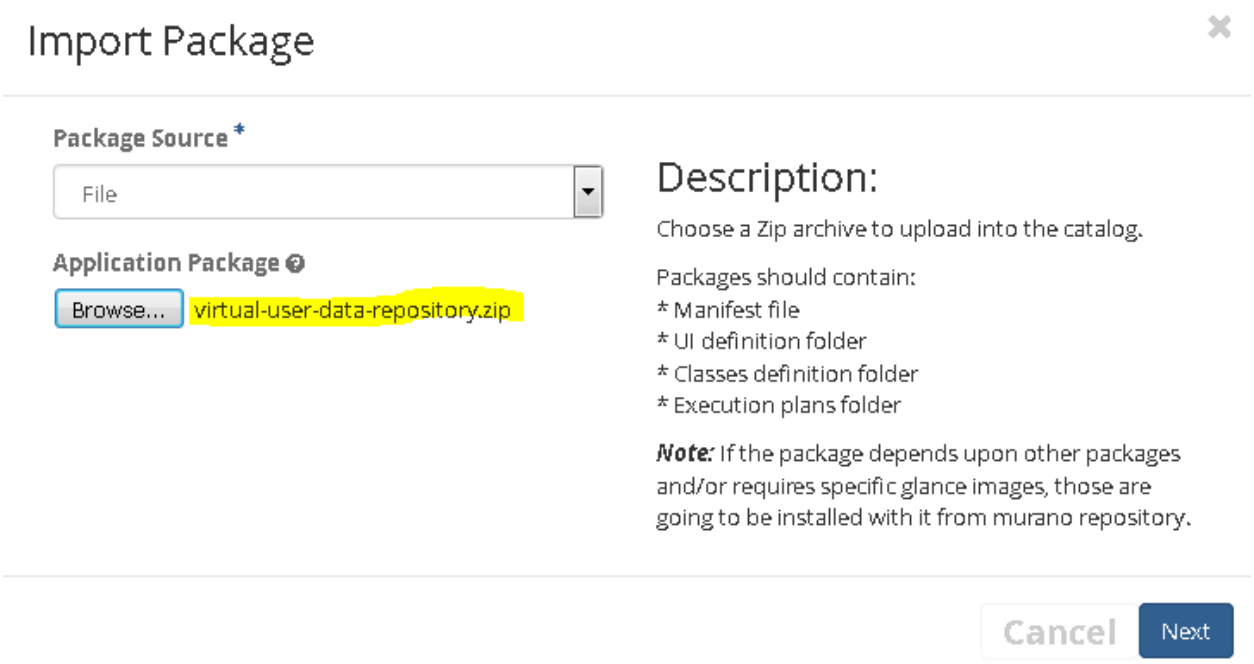
2. Once you get the virtual-user-data-repository.zip file, upload it in Horizon.
Below are the detailed steps for this:
(a) In Horizon, navigate to Manage -> Packages and click on “Import Package” button shown highlighted in below screenshot.



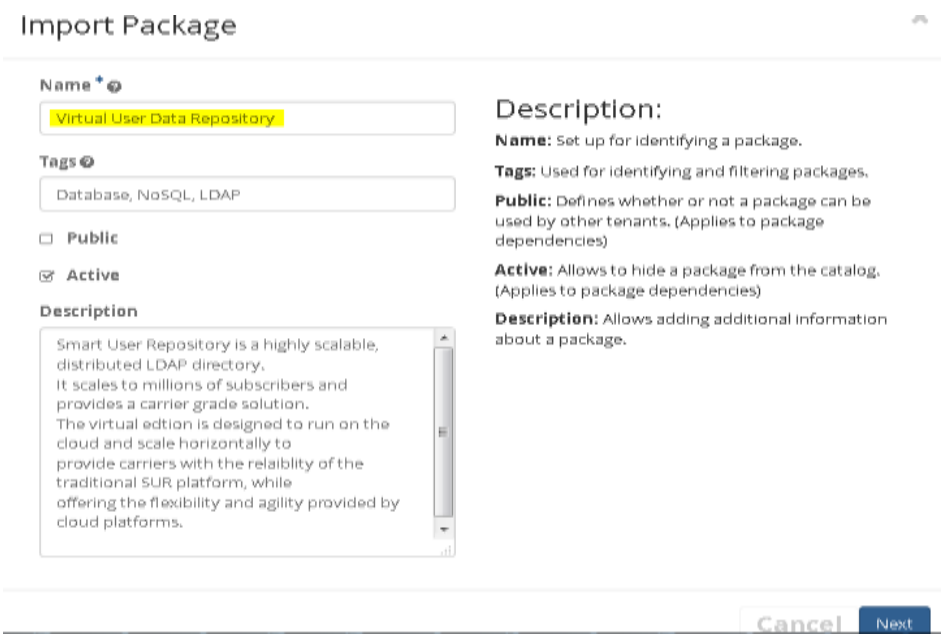
(b) In the new window that pops up, select Package Source as “File” and then click Browse.



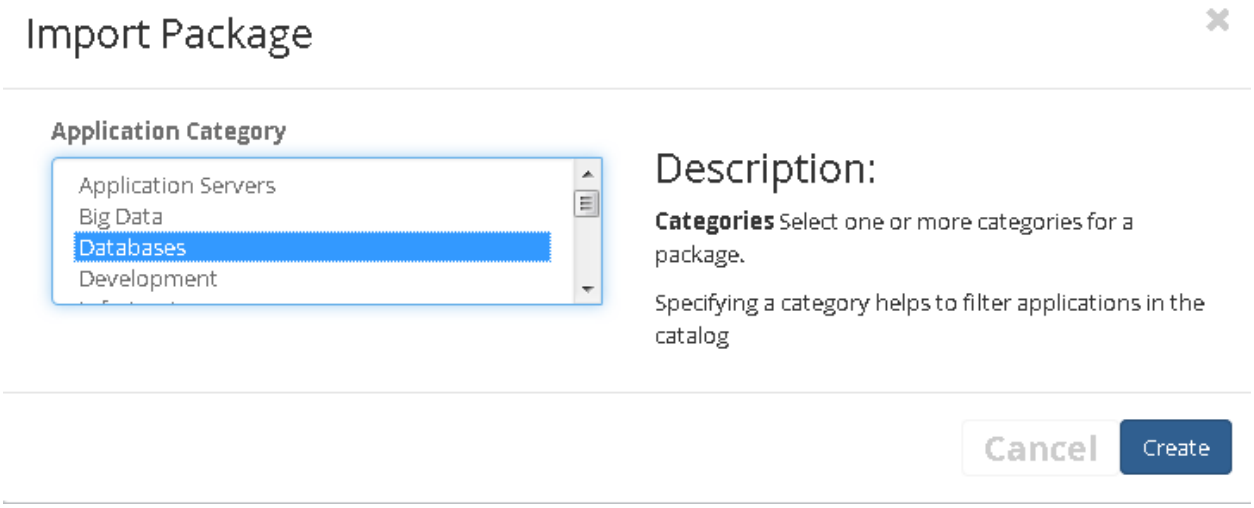
(c) Browse for the Zip file and select it. Click on Next button.



(d) Give the name to the package that you want to appear in the packages page, then click the “Next” button.



(e) Select the appropriate Application Category as shown below and click “Create”.



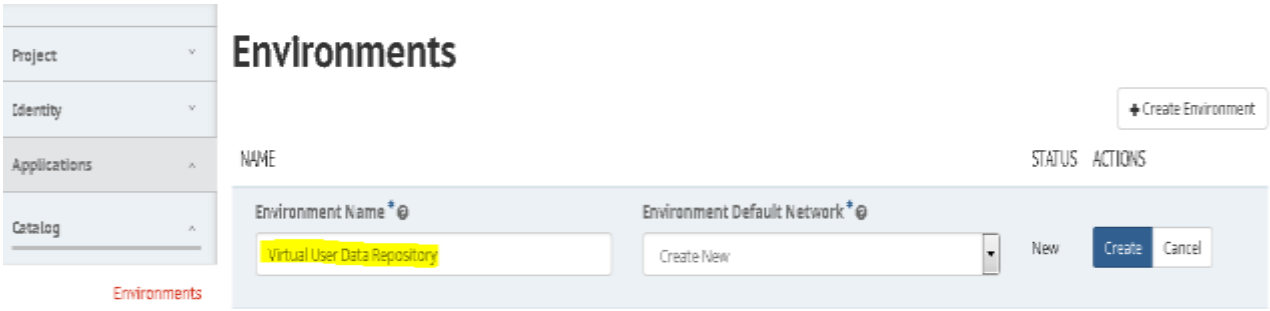
(f) Verify that the Package of Virtual User Data Repository gets added and is displayed in Packages page of Horizon.

4.3.2 Steps for creating the Environment with vUDR Murano package

Once you have the package in the Horizon, you need to create an Environment and add the above package in it. Below are the detailed steps for this.

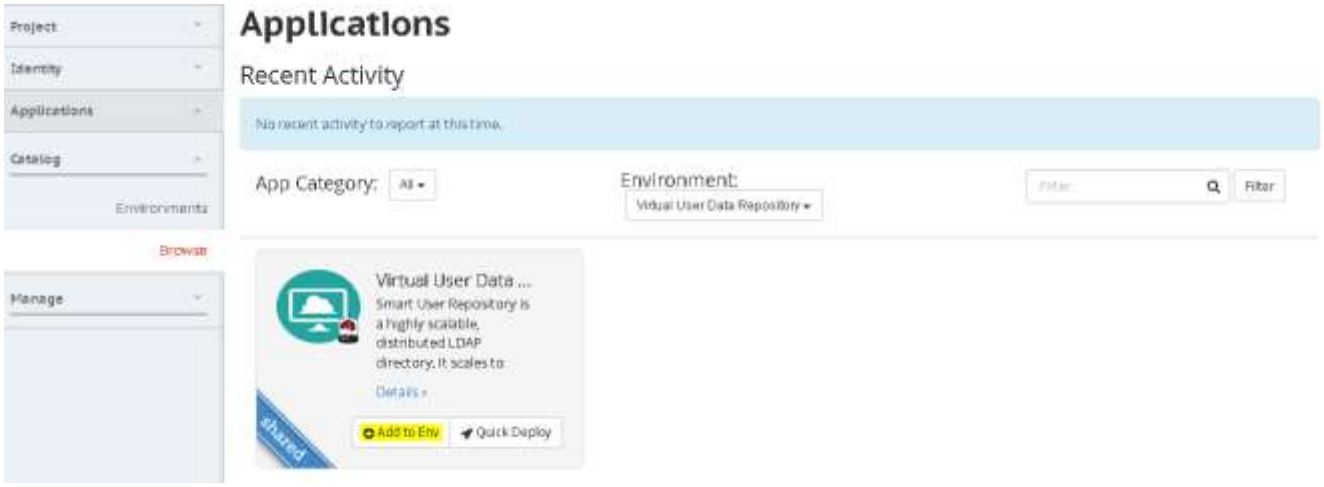
(a) Navigate to “Catalog’ -> “Environments” page and Click “Create Environment” button.

(b) Give proper name to the Environment. Select the network you want this Environment to use or select “Create New” network. Then click “Create” button.



(c) Once you are in above created Environment, now you need to add vUDR component in it. For this click the “Add Component” button.

(d) Select the component (package) for vUDR and click “Add to Env” button.



(e) Complete details for the cluster. It is recommended to use at least 3 seed nodes, to support the replication factor of 3. Below is an example:

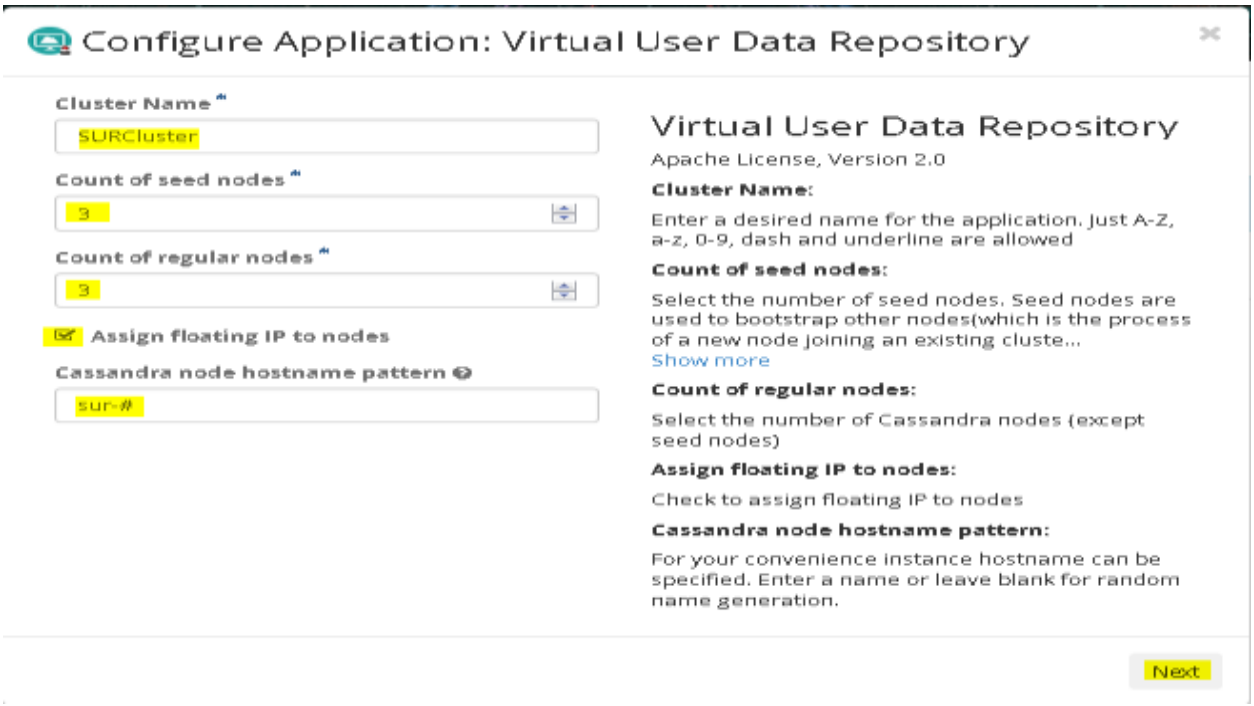
Name: SUR Cluster

Count of Seed Nodes: 3

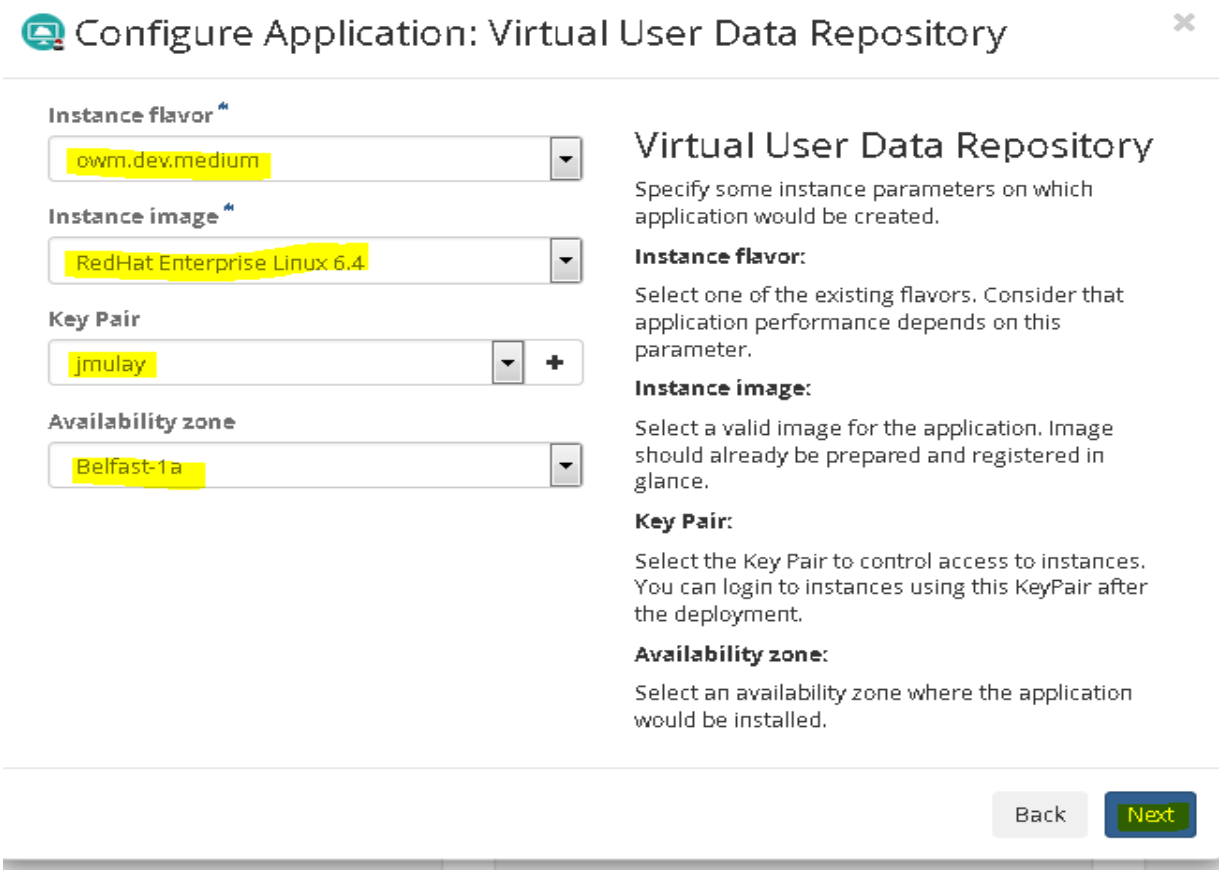
Count of Regular Nodes: 3

Assign floating IP to nodes should be “Selected”.

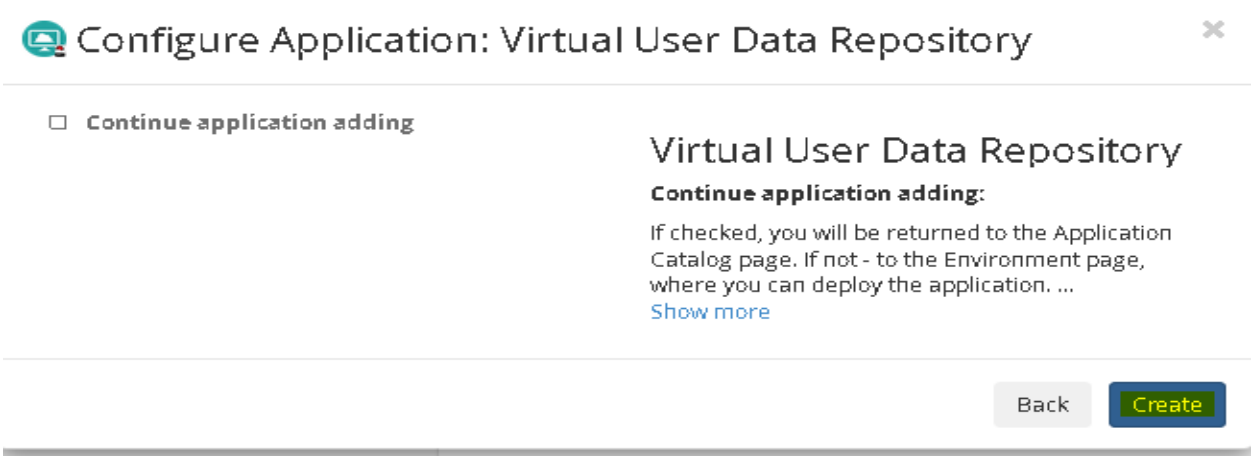
Give appropriate “Cluster Name” and “Cassandra node hostname pattern” and then click “Next” button.



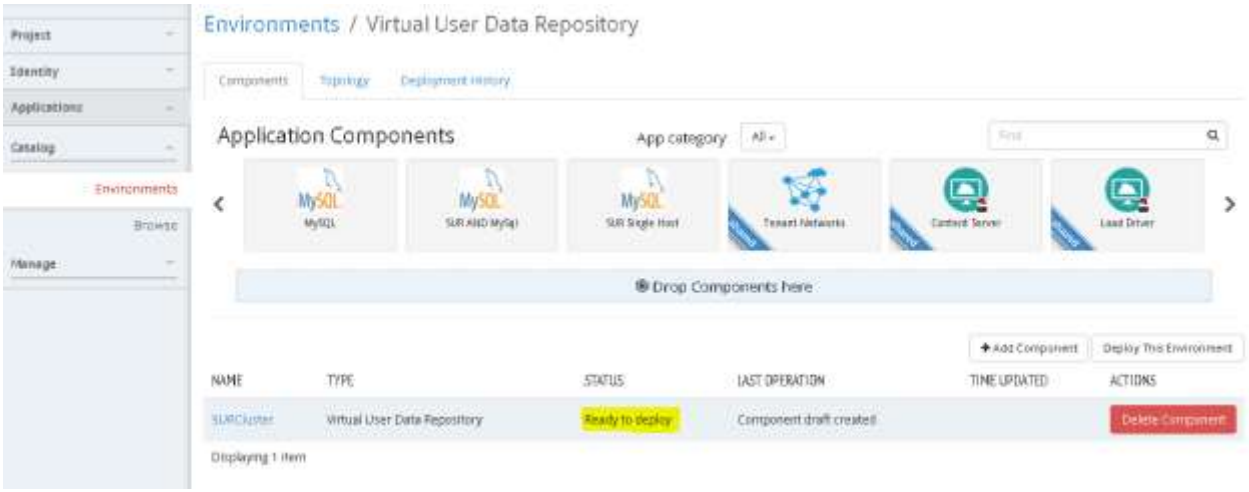
(f) Select the size of your vUDR VMs, the Red Hat image, and optionally a Key Pair. Once ready you can click on “Next” button.



(g) Finally click the “Create” button to Create the Environment.



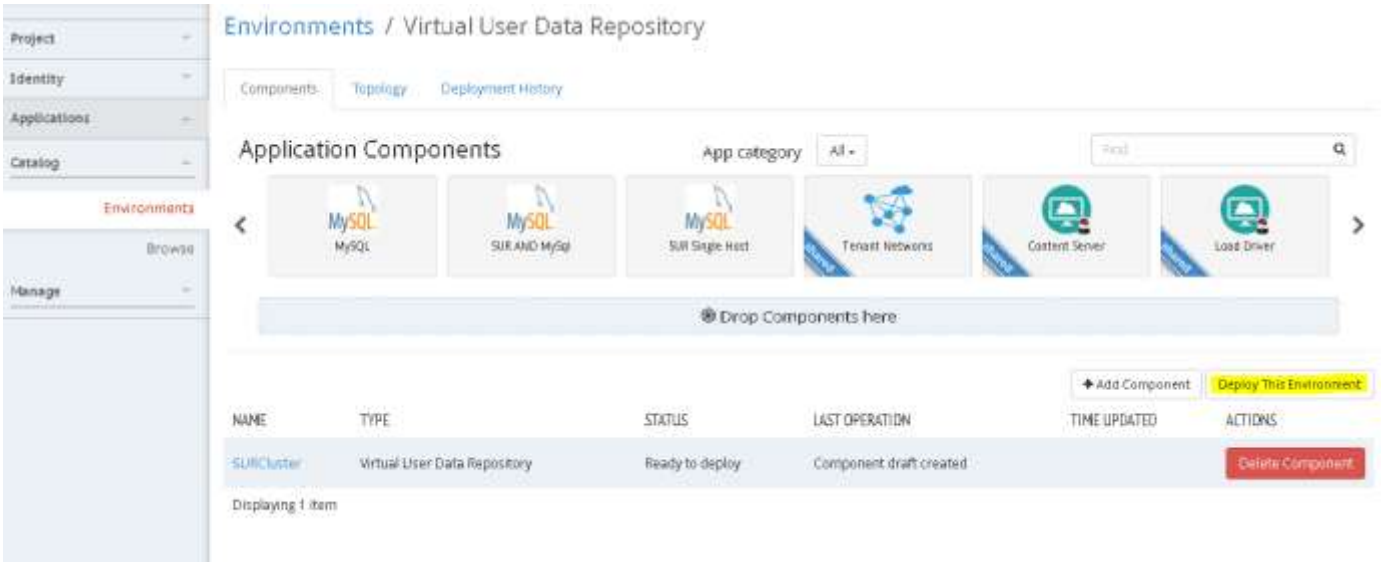
(h) Verify that the Environment gets created and is in “Ready to Deploy” State.



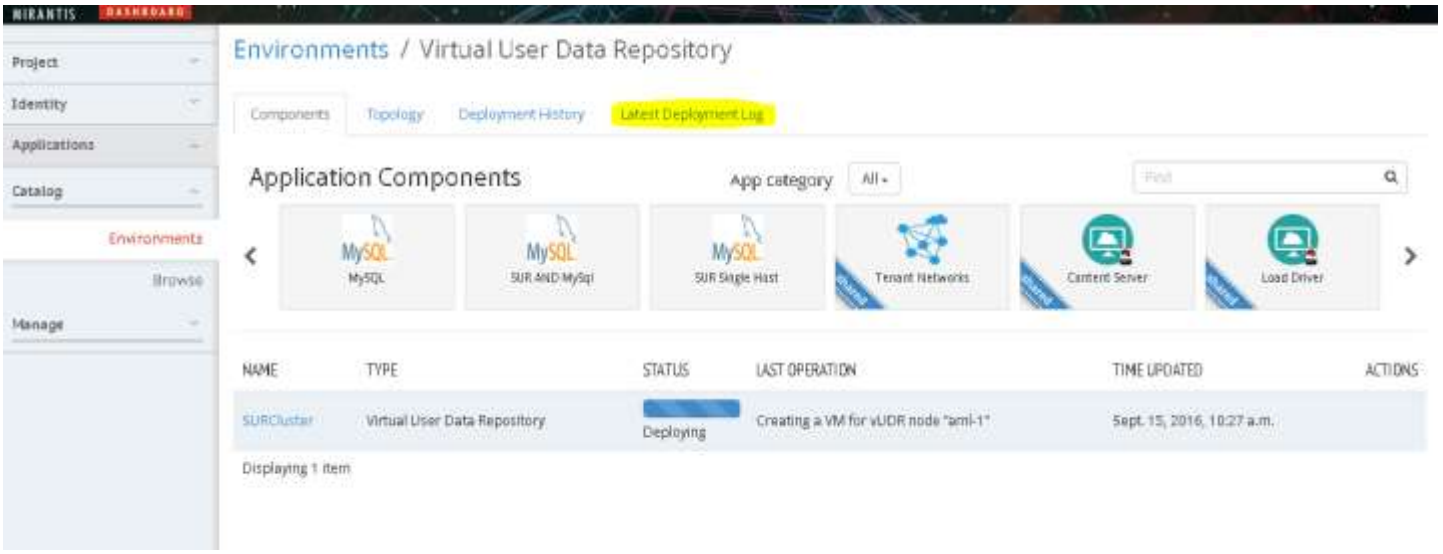
4.3.3 Steps for creating the Environment with vUDR Murano package

Once you have created the Environment as explained above, you need to Deploy the Environment. Below are the detailed steps for deploying the environment.

(a) Navigate to “Catalog’ -> “Environments” page and Click the above created Environment (in our example case it is named as “Virtual User Data Repository”. Then click “Deploy This Environment” button.

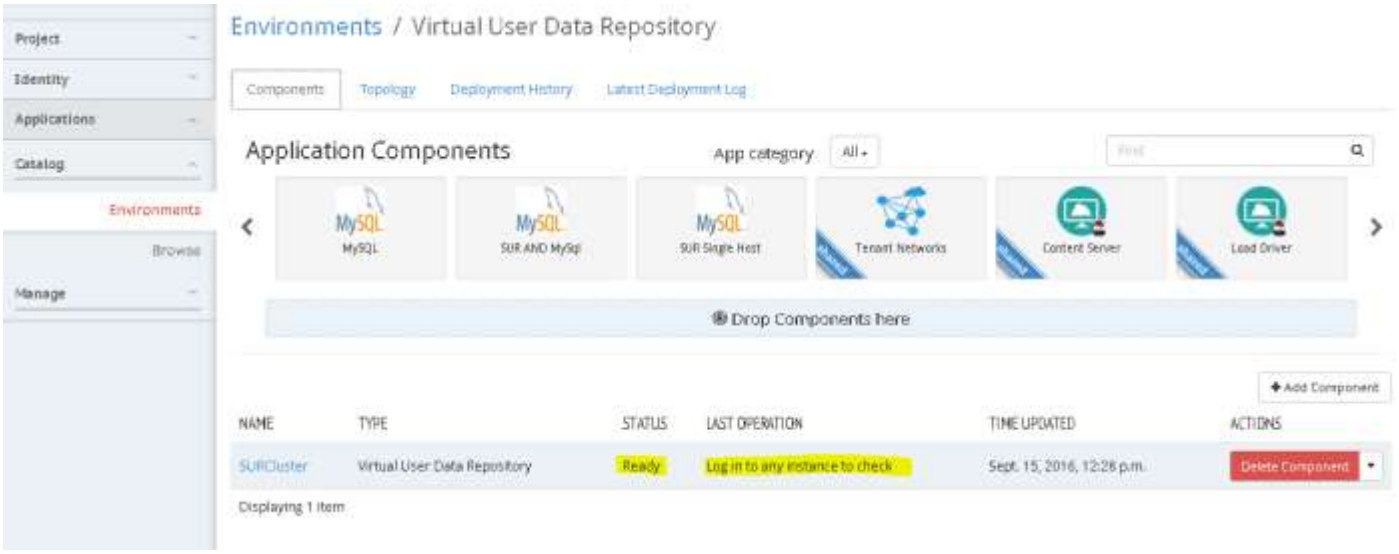


(b) This will start the deployment on the “Virtual User Data Environment”. If there are any errors, then they will be displayed in “Latest Deployment Log” as shown below.



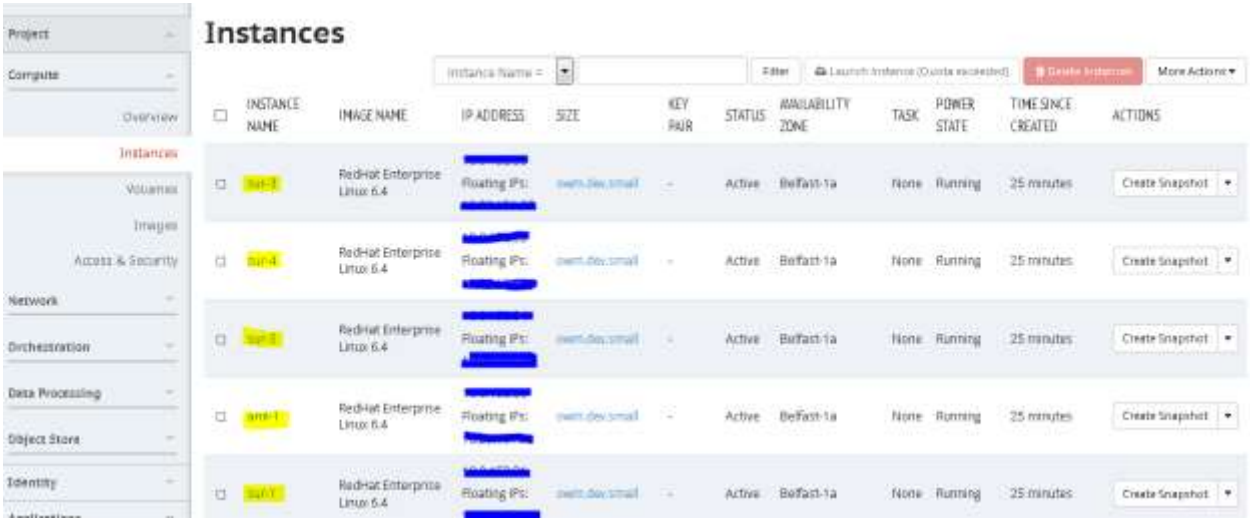
In case of errors check the details in “Latest Deployment Log” and remove the errors and the “Deploy” the Environment again repeating above step (i.e. 4.3.3 (a))

(c) Once the deployment is complete its Status will be shown as “Ready”.



4.4 Accessing the app after the installation

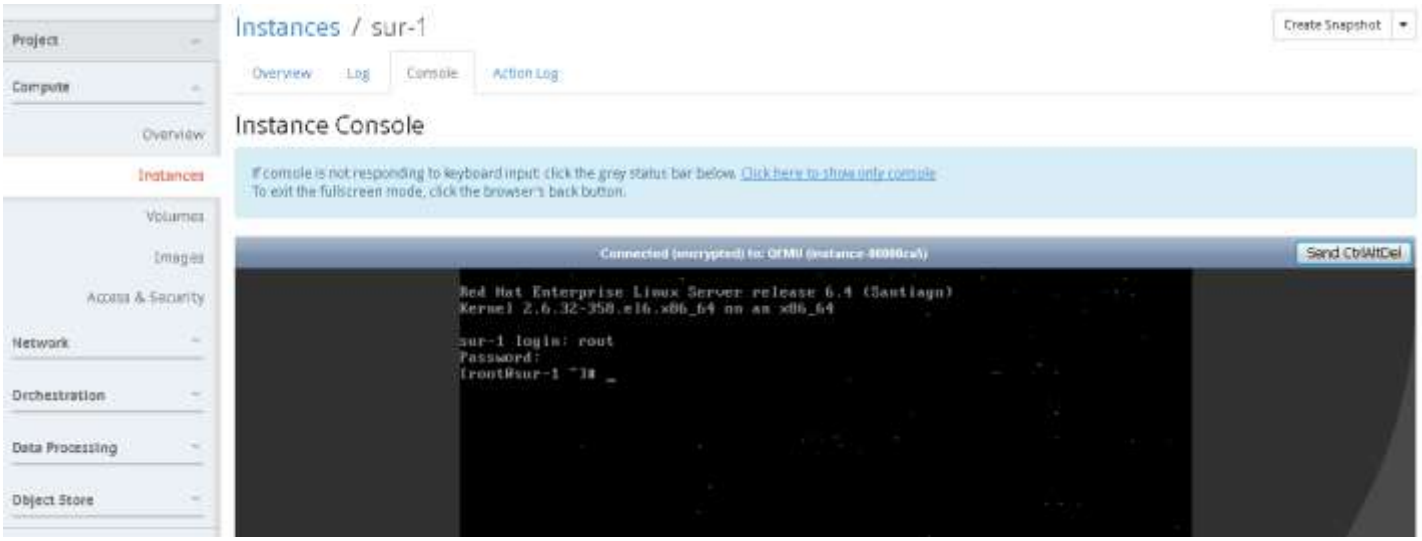
(a) Once the Application is deployed you can see that the instances corresponding to vUDR environment are displayed in the list of Instances. To check this navigate to “Project” -> “Compute” -> “Instances” page of Horizon.



(b) Note the Floating IP address of any one host say “sur-1”.

(c) Login to this machine using either ssh or using console page provided by Horizon. For accessing through the “Console” from Horizon

i. First navigate to any one specific instance page by clicking on “Project” -> Compute -> Instances -> Actual instance name (in our case it is sur-1)
ii. Navigate to “Console” tab.



(d) Login as imail user as shown below and switch to the bash shell. After this run ".profile" as shown below to set the environment. Run the server ping command (imservping) to check that the servers are up and running on this host.

```
Red Hat Enterprise Linux Server release 6.4 (Santiago)
Kernel 2.6.32-358.el6.x86_64 on an x86_64

sur-1 login: root
Password:
Last login: Thu Sep 15 13:55:17 on tty1
[root@sur-1 ~]# su  - imail
sur-1:imail:opwv$ bash
sur-1:imail:opwv$ . .profile
sur-1:imail:opwv$ imservping
```

```
sur-1:imail:opwv$ imservping
Thu Sep 15 13:57:34 2016. imservping: (Info) immgrserv responded
Thu Sep 15 13:57:34 2016. imservping: (Info) imdirserv responded
sur-1:imail:opwv$
```

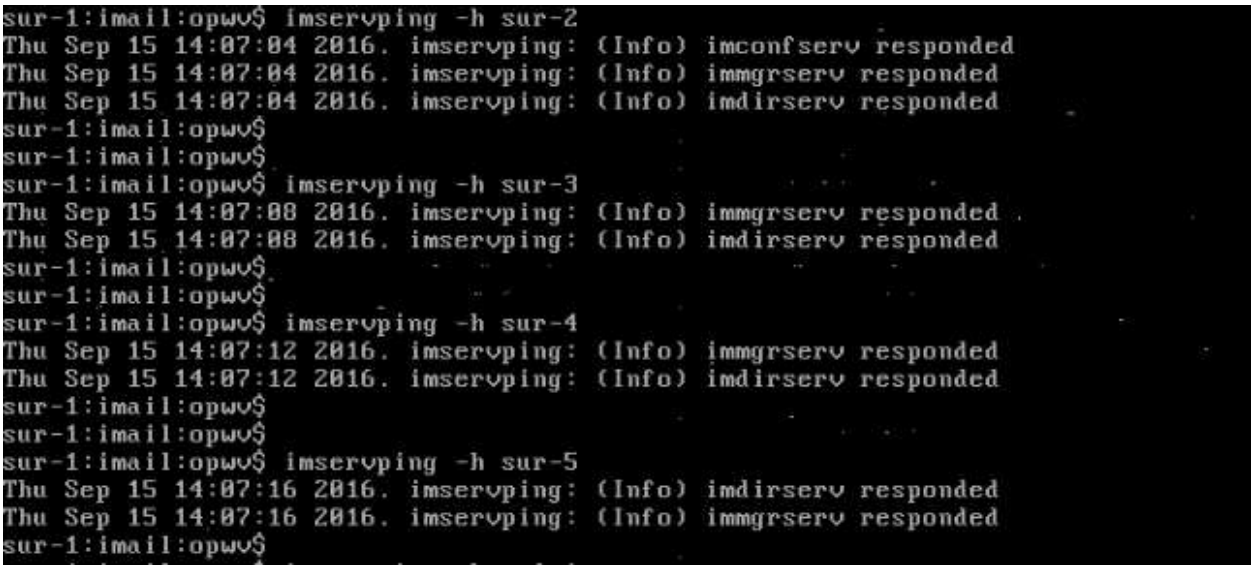
(e) If the servers are not running, you can start/restart the servers using below command:

```
[root@sur-1 ~]# su  - imail
sur-1:imail:opwv$ bash
sur-1:imail:opwv$ . .profile
sur-1:imail:opwv$ ~/lib/imservctrl start
```

(f) Ignore below Notifications that come during start of the servers. These come because in Demo version we have not enabled SNMP and some other features:

```
imservctrl: Notice: imautoswitchover not configured to run on this host
imservctrl: Notice: imswitchoverlistener not configured to run on this host
imservctrl: Notice: imlatextract and impmsextract will not start as SNMP is not
enabled.
imservctrl: Notice: imlatextract and impmsextract will not start as SNMP is not
enabled.
```

(g) Similarly, you can ping servers on any of the sur-# hosts either from current host which is sur-1 in our example. This is shown below. Or you can also login to those hosts and locally ping the servers as explained above.



(h) Similarly, you can execute your own LDAP commands as per your test needs. Some examples of the commands are given in “Section 4.6 Testing”.

4.5 Limitations

The demo version of the solution deploys in a single availability zone. This means replication is restricted to within that zone.

4.6 Testing

4.6.1 Test cases

1. Check that all the LDAP servers are up on each host of the system and running on correct configured ports.

   Steps : SSH into server with key, and switch to imail user on any sur-# LDAP host and run below commands:
   # . .profile
   # $INTERMAIL\chk_servers_port.sh

2. Check that the data (entry) can be added to a vUDR through its LDAP port and verify that this newly added entry can be searched from other vUDR servers in the system. Repeat the same for all the hosts.

   Steps : SSH into server with key, and switch to imail user on any sur-# host and run below commands:
   # . .profile
   # $INTERMAIL\chk_addition.sh

3. Check that the data (entry) can be modified through a vUDR server through its LDAP port and verify that this modified entry can be searched from other vUDR servers in the system. Repeat the same for all the hosts.

   Steps : : SSH into server with key and switch to imail user on any sur-# LDAP host and run below commands:
   # . .profile
   # $INTERMAIL\chk_modification.sh

4. Check that the data (entry) can be deleted from a vUDR server through its LDAP port and verify that this entry is deleted from other vUDR servers in the system. Repeat the same for all the hosts.

   Steps : : SSH into server with key and switch to imail user on any sur-# LDAP host and run below commands:
   # . .profile
   # $INTERMAIL\chk_deletion.sh