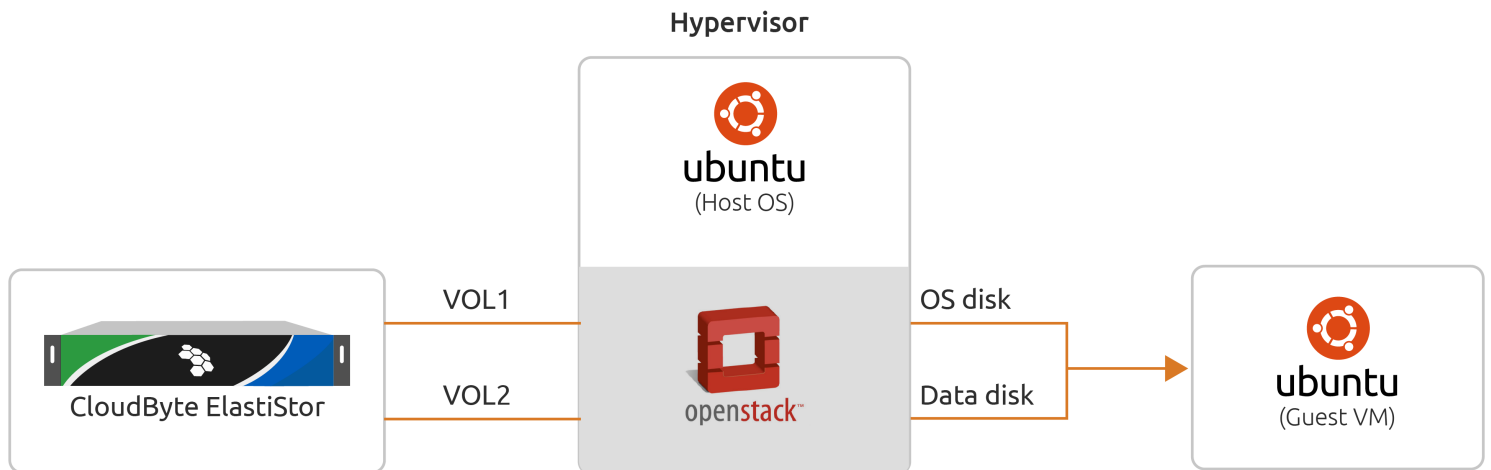


# Perform application consistent snapshots on KVM using CloudByte ElastiStor

## Use case

A KVM hypervisor running on an Ubuntu Server consuming storage from CloudByte ElastiStor.

The ElastiStor volumes integrated with OpenStack are used as OS disk and data disk for the Guest VM.



## Components

Component	Name	Version
Hypervisor	KVM	QEMU emulator version 2.0.0
Host OS	Ubuntu	Ubuntu 14.04.1 LTS
Cloud Platform	OpenStack	IceHouse and higher versions
Storage	CloudByte ElastiStor	1.4.0.340
Guest VM	Ubuntu	Ubuntu 14.04.1 LTS
CLI tool for managing Hypervisor	Virsh	1.2.2
QEMU Guest agent		QEMU Guest Agent 2.0.0

## Prerequisites

- Install KVM Hypervisor on Ubuntu Server. For details, see [KVM installation](#).
- Download an Ubuntu QCOW2 image. For details, see [Ubuntu based images](#).
- Run the following commands on the Hypervisor to permit socket creation for AppArmor:
  1. `sudo echo "/var/lib/libvirt/qemu/*.sock rw," | sudo tee -a /etc/apparmor.d/abstractions/libvirt-qemu`
  2. `sudo service libvirt-bin restart`

3. `sudo service nova-compute restart`
4. `sudo service apparmor reload`

## Workflow

1. Check the Hypervisor details. For details, see "[Check the Hypervisor details](#)".
2. Install OpenStack on the Ubuntu Server. For details, see [Install OpenStack](#).
3. Set up the OpenStack security and access configurations. For details, see "[Set up the OpenStack security and access configurations](#)".
4. Set metadata of the Ubuntu QCOW2 image using the following command: `nova image-meta QCOW2_image_ID set hw_qemu_guest_agent=yes`
5. Launch OpenStack instance using the Ubuntu image and perform network configuration. For details, see "[Launch OpenStack instance and perform network configuration](#)".
6. Install the QEMU Guest Agent on the virtual machine. For details, see "[Install the QEMU Guest agent on the virtual machine](#)".
7. Perform application consistent snapshot. For details, see "[Perform application consistent snapshot](#)"

## Check the Hypervisor details

Perform the following procedures to check the hypervisor details:

1. Log in to the Hypervisor.
2. Run the following command to fetch the version of installed Ubuntu OS: `# lsb_release -a`
3. Run the following command to check the virsh version of Ubuntu OS: `virsh --version`

## Set up the OpenStack security and access configurations

1. Log in to the OpenStack command prompt.
2. Run the following commands to create security groups for TCP protocol: `nova secgroup-add-rule security_group_name tcp 22 22 0.0.0.0/0`
3. Run the following commands to create security groups for ICMP protocol: `nova secgroup-add-rule security_group_name icmp -1 -1 0.0.0.0/0`

## Launch OpenStack instance and perform network configuration

1. Launch an OpenStack instance from the Ubuntu image. For details, see [Launch an instance](#).
2. Log in to the OpenStack command prompt.
3. Assign a floating IP address to the Ubuntu instance. For details, see [Assign floating IP address](#).

## Install the QEMU Guest Agent on the virtual machine

Perform the following procedures to install the QEMU Guest Agent:

1. Log in to the Guest VM (Ubuntu instance).
2. Run the following command to fetch new versions of packages on the machine: `sudo apt-get update`.
3. Run the following command to install the QEMU-guest agent: `sudo apt-get install qemu-guest-agent`.
4. Run the following command to fetch the version of QEMU Guest Agent: `qemu-ga --version`. Ensure that version is QEMU Guest Agent 2.0.0 or higher.

## Perform application consistent snapshot

1. Run the following command to fetch the existing instances: `virsh list`. Make a note of the instance ID in the output.
2. Run the following command to pause the I/Os in progress: `virsh qemu-agent-command instance-instance_ID '{"execute": "guest-fsfreeze-freeze"}'`
3. (In ElastiCenter) Create snapshot for the Storage Volume. For details, see ["Configuring local backup"](#).
4. Run the following command to release the paused I/Os: `virsh qemu-agent-command instance-instance_id '{"execute": "guest-fsfreeze-thaw"}'`

## FAQs

### How can I ensure that the VM disk is on CloudByte Storage?

Run the following command on the Hypervisor: `virsh edit instance_ID`. The disk type should be *block* as seen in the sample output in screenshot 1.

### How can I ensure that the VM has QEMU Guest Agent is successfully installed?

Run the following command on the Hypervisor: `virsh edit instance_ID`. The Channel type should be *unix* as seen in the sample output in the screenshot 1.

### Screenshot 1:

```
<devices>
  <emulator>/usr/bin/qemu-kvm</emulator>
  <disk type='block' device='disk'>
    <driver name='qemu' type='raw' cache='none' />
    <source dev='/dev/disk/by-path/ip-192.168.1.252:3260-iscsi-ign.2015-01.accl.cinder:accl157dce3483fb4e75a3e7393f12c77f6b-lun-0' />
    <target dev='vda' bus='virtio' />
    <serial>157dce34-83fb-4e75-a3e7-393f12c77f6b</serial>
    <address type='pci' domain='0x0000' bus='0x00' slot='0x05' function='0x0' />
  </disk>
  <controller type='usb' index='0'>
    <address type='pci' domain='0x0000' bus='0x00' slot='0x01' function='0x2' />
  </controller>
  <controller type='pci' index='0' model='pci-root' />
  <controller type='virtio-serial' index='0'>
    <address type='pci' domain='0x0000' bus='0x00' slot='0x04' function='0x0' />
  </controller>
  <interface type='bridge'>
    <mac address='fa:16:3e:c2:0f:00' />
    <source bridge='br100' />
    <model type='virtio' />
    <filterref filter='nova-instance-instance-00000047-fa163ec20f00' />
    <address type='pci' domain='0x0000' bus='0x00' slot='0x03' function='0x0' />
  </interface>
  <serial type='file'>
    <source path='/var/lib/nova/instances/077d078f-6933-42da-8be4-79f02d56de43/console.log' />
    <target port='0' />
  </serial>
  <serial type='pty'>
    <target port='1' />
  </serial>
  <console type='file'>
    <source path='/var/lib/nova/instances/077d078f-6933-42da-8be4-79f02d56de43/console.log' />
    <target type='serial' port='0' />
  </console>
  <channel type='unix'>
    <source mode='bind' path='/var/lib/libvirt/qemu/org.qemu.guest_agent.0.instance-00000047.sock' />
    <target type='virtio' name='org.qemu.guest_agent.0' />
    <address type='virtio-serial' controller='0' bus='0' port='1' />
  </channel>
  <input type='tablet' bus='usb' />
  <input type='mouse' bus='ps2' />
  <input type='keyboard' bus='ps2' />
  <graphics type='vnc' port='-1' autoport='yes' listen='0.0.0.0' keymap='en-us' />
```