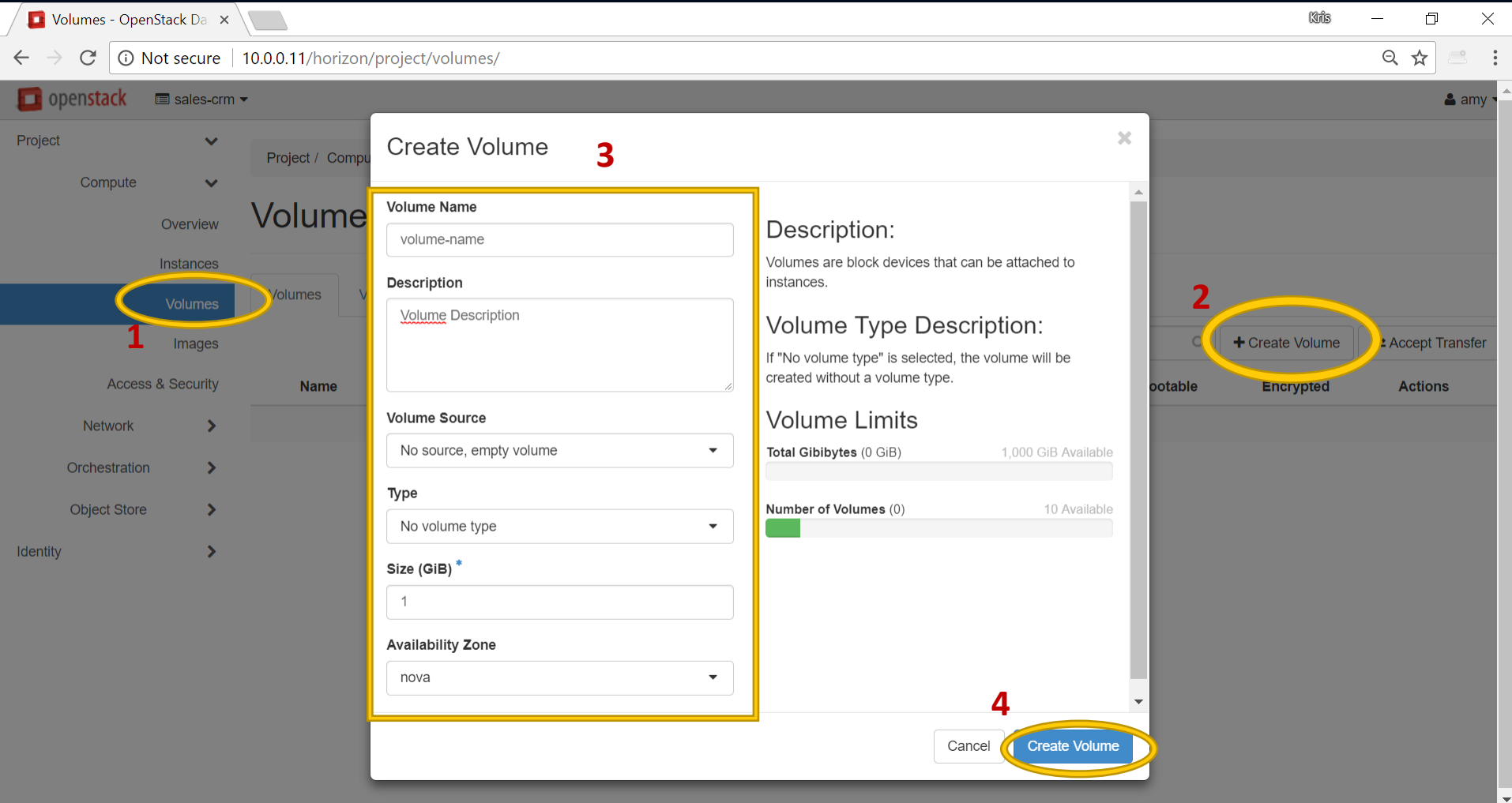


Preparing to **Certified OpenStack Administrator** Exam

## Section 7 – Cinder Block Storage

*Lecture 30. Cinder Summary and Review*

# Create a Volume



The screenshot shows the OpenStack Horizon interface with the 'Create Volume' dialog box open. The dialog box is titled 'Create Volume' and contains several sections for configuring a new volume. The background shows the 'Volumes' tab selected in the left sidebar, and a '+ Create Volume' button circled in the main content area.

**Annotations:**

- 1**: Points to the 'Volumes' tab in the left sidebar.
- 2**: Points to the '+ Create Volume' button in the main content area.
- 3**: Points to the 'Create Volume' dialog box title.
- 4**: Points to the 'Create Volume' button at the bottom right of the dialog box.

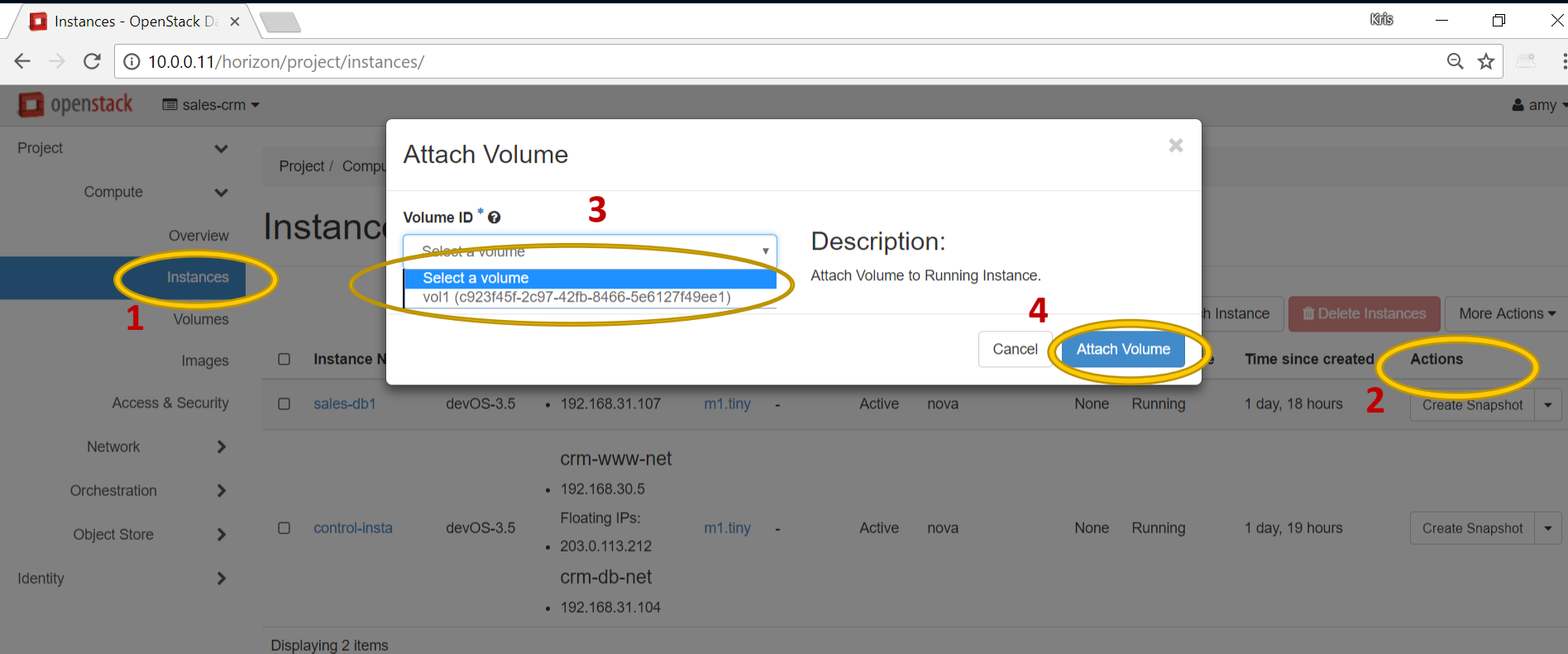
**Dialog Box Fields:**

- Volume Name**: Input field with placeholder 'volume-name'.
- Description**: Text area with placeholder 'Volume Description'.
- Volume Source**: Dropdown menu with 'No source, empty volume' selected.
- Type**: Dropdown menu with 'No volume type' selected.
- Size (GiB) \***: Input field with '1' entered.
- Availability Zone**: Dropdown menu with 'nova' selected.

**Dialog Box Information:**

- Description:** Volumes are block devices that can be attached to instances.
- Volume Type Description:** If "No volume type" is selected, the volume will be created without a volume type.
- Volume Limits:**
  - Total Gibibytes (0 GiB)**: 1,000 GiB Available
  - Number of Volumes (0)**: 10 Available

# Attach a Volume to an Instance



The screenshot shows the OpenStack Horizon interface with the 'Attach Volume' dialog box open. The dialog box has a title bar 'Attach Volume' and a close button. It contains a 'Volume ID' field with a dropdown menu, a 'Description' field, and two buttons: 'Cancel' and 'Attach Volume'.

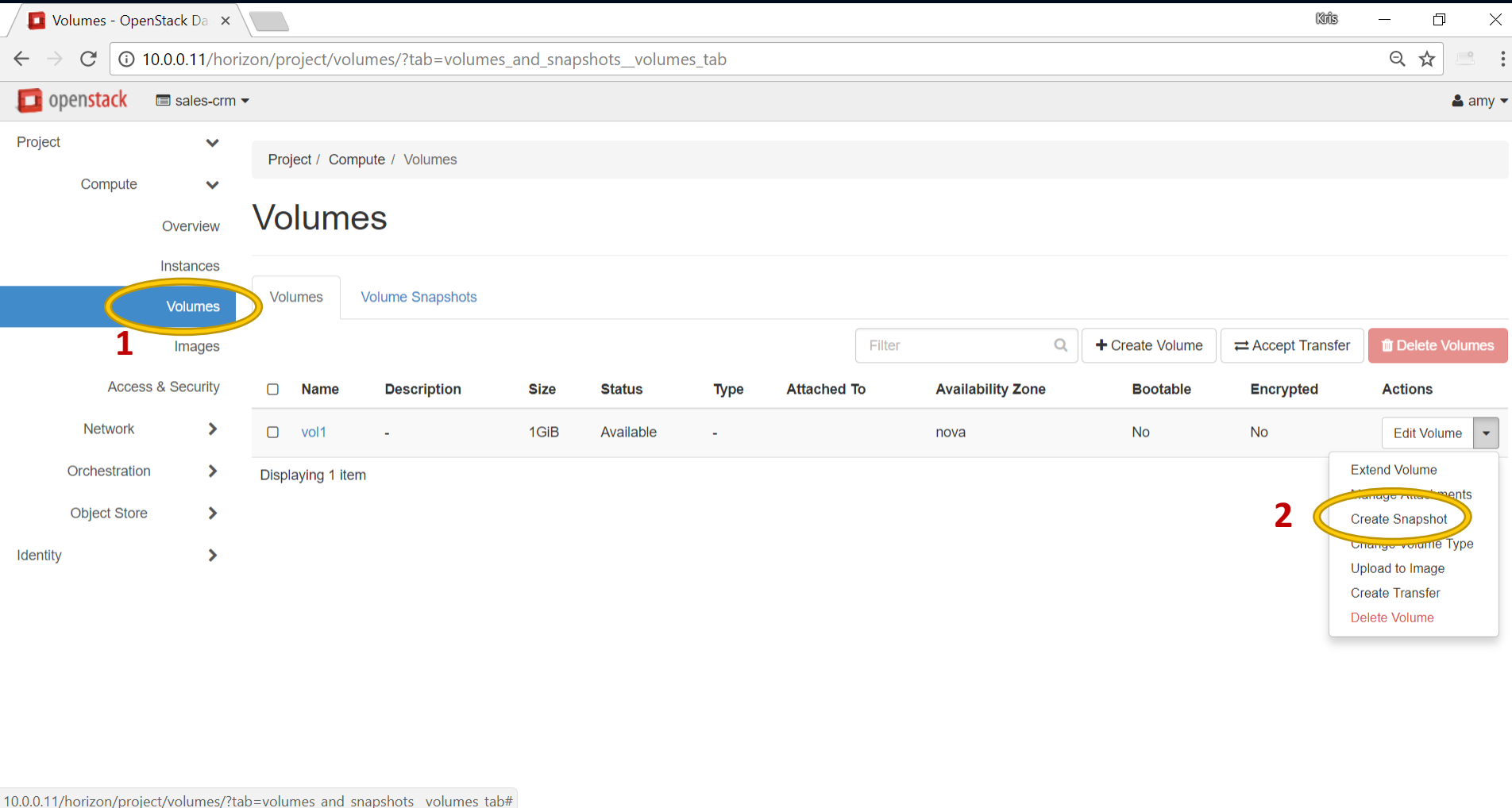
Red numbers 1 through 4 highlight key UI elements:

- 1. 'Instances' in the left sidebar.
- 2. 'Actions' column header in the instance table.
- 3. The 'Volume ID' dropdown menu in the dialog.
- 4. The 'Attach Volume' button in the dialog.

The background shows a table of instances with columns: Instance Name, Image, Flavor, IP Address, Status, Nova ID, Network, Time since created, and Actions. The table displays two instances: 'sales-db1' and 'control-insta'.

| Instance Name | Image     | Flavor  | IP Address     | Status | Nova ID | Network                     | Time since created | Actions         |
|---------------|-----------|---------|----------------|--------|---------|-----------------------------|--------------------|-----------------|
| sales-db1     | devOS-3.5 | m1.tiny | 192.168.31.107 | Active | nova    | crm-www-net                 | 1 day, 18 hours    | Create Snapshot |
| control-insta | devOS-3.5 | m1.tiny | 192.168.30.5   | Active | nova    | Floating IPs: 203.0.113.212 | 1 day, 19 hours    | Create Snapshot |

# Create Volume Snapshot



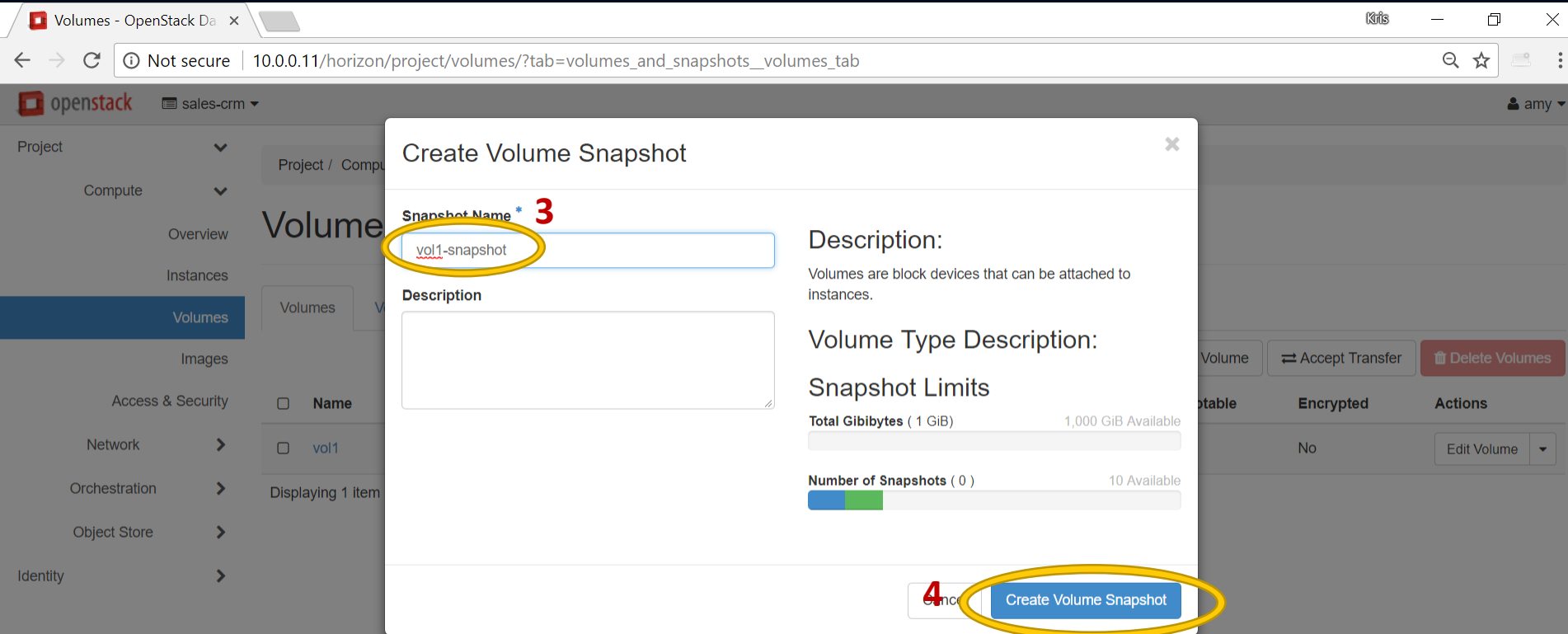
The screenshot shows the OpenStack Horizon web interface. The browser address bar displays the URL `10.0.0.11/horizon/project/volumes/?tab=volumes_and_snapshots_volumes_tab`. The OpenStack logo and 'sales-crm' dropdown are visible in the top navigation bar. On the left sidebar, the 'Volumes' menu item is circled in blue and labeled with a red '1'. The main content area is titled 'Volumes' and contains a breadcrumb 'Project / Compute / Volumes'. Below the title, there are tabs for 'Volumes' and 'Volume Snapshots'. A table lists the available volumes:

| Name | Description | Size | Status    | Type | Attached To | Availability Zone | Bootable | Encrypted | Actions                     |
|------|-------------|------|-----------|------|-------------|-------------------|----------|-----------|-----------------------------|
| vol1 | -           | 1GiB | Available | -    | -           | nova              | No       | No        | <a href="#">Edit Volume</a> |

Below the table, it says 'Displaying 1 item'. A context menu is open for the 'vol1' volume, with the 'Create Snapshot' option circled in blue and labeled with a red '2'. The context menu options are: Extend Volume, Manage Attachments, Create Snapshot, Change Volume Type, Upload to Image, Create Transfer, and Delete Volume.

10.0.0.11/horizon/project/volumes/?tab=volumes\_and\_snapshots\_volumes\_tab#

# Create Volume Snapshot



Volumes - OpenStack Dashboard

10.0.0.11/horizon/project/volumes/?tab=volumes\_and\_snapshots\_volumes\_tab

Project / Compute

Volume

Overview

Instances

Volumes

Images

Access & Security

Network

Orchestration

Object Store

Identity

Project / Compute

Volume

Displaying 1 item

Name

vol1

Create Volume Snapshot

Snapshot Name \* 3

vol1-snapshot

Description

Description:

Volumes are block devices that can be attached to instances.

Volume Type Description:

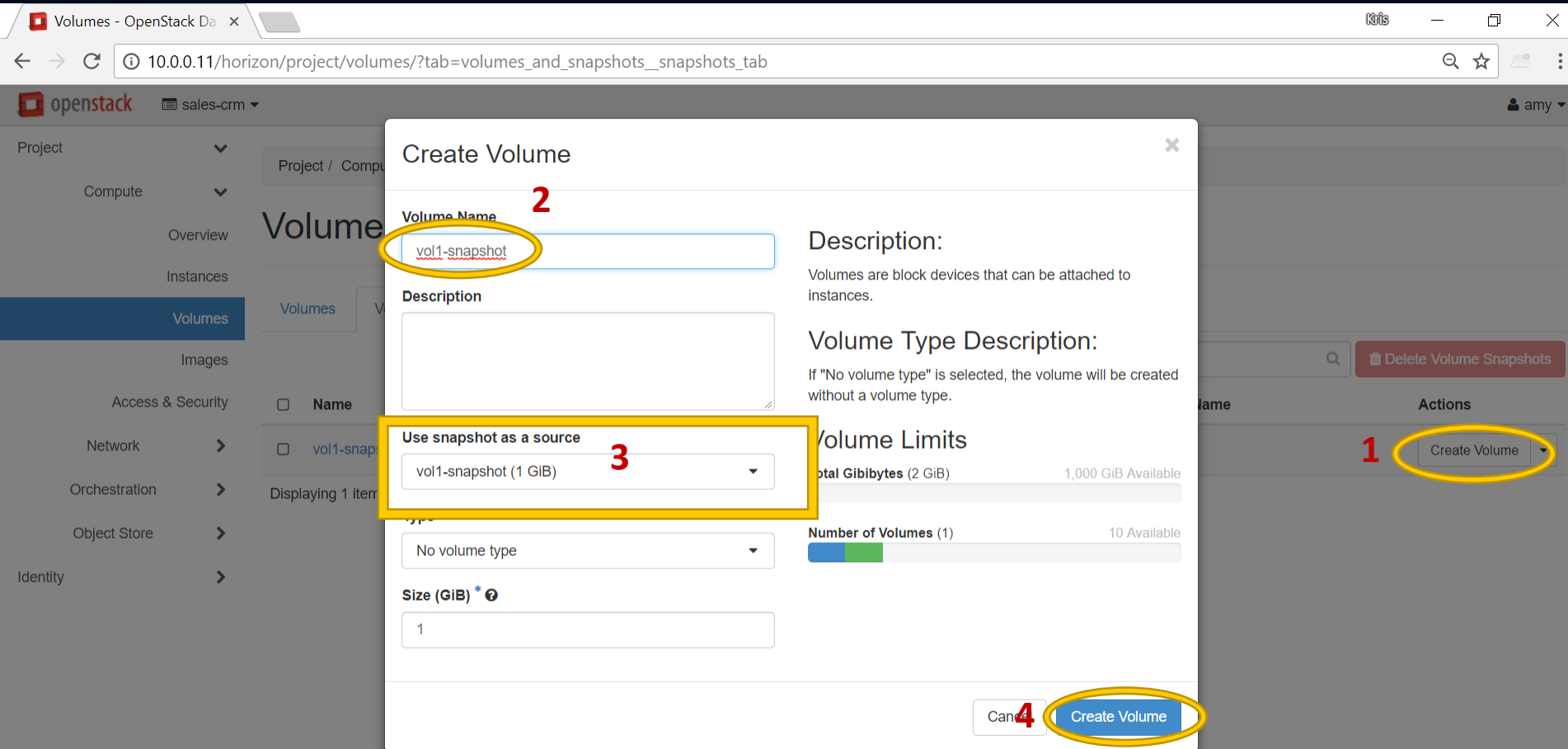
Snapshot Limits

Total Gibibytes ( 1 GiB) 1,000 GiB Available

Number of Snapshots ( 0 ) 10 Available

4 Create Volume Snapshot

# Create New Volume from Snapshot

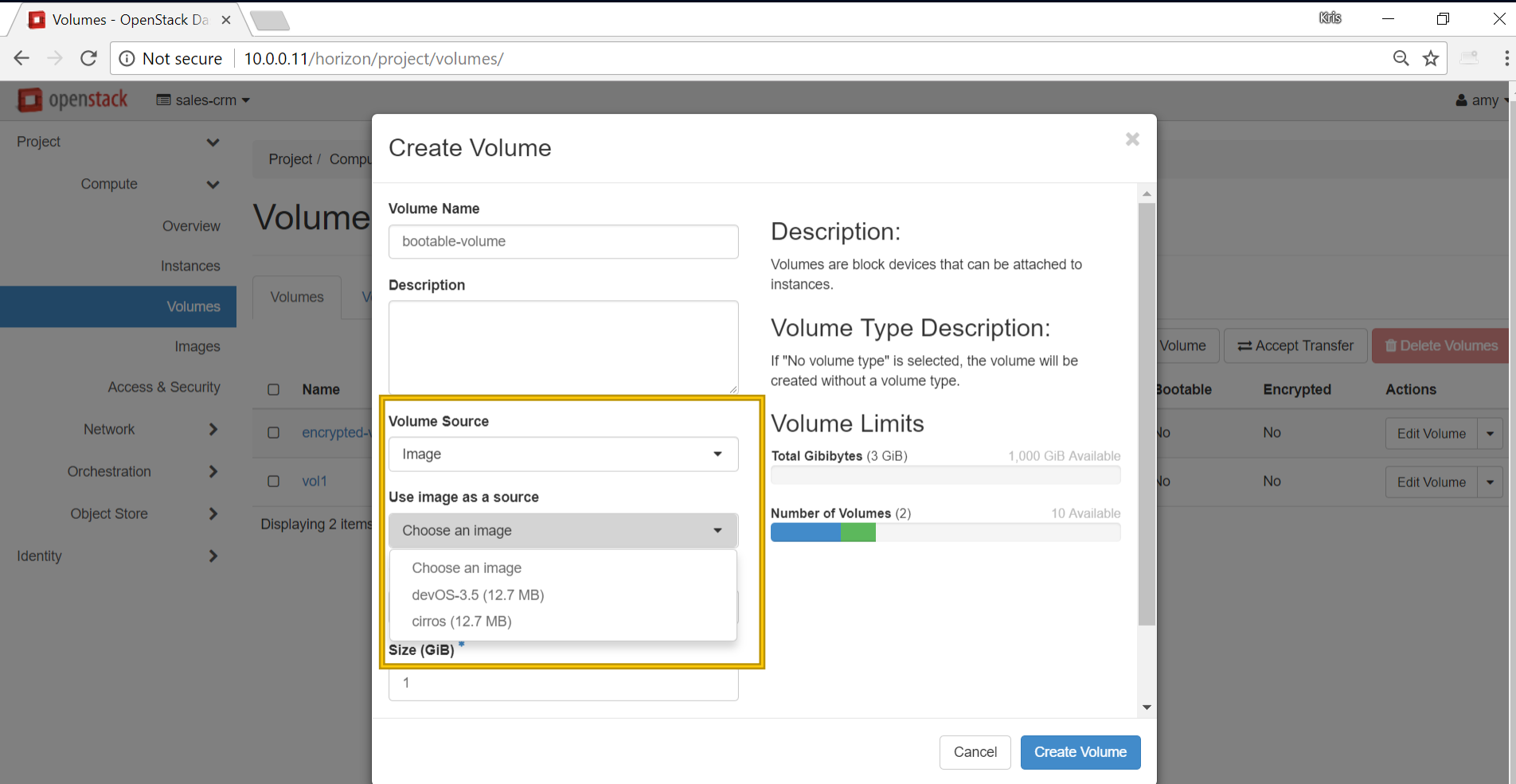


The screenshot shows the OpenStack Horizon interface with the 'Create Volume' dialog box open. The dialog box has the following fields and elements:

- Volume Name:** A text input field containing 'vol1-snapshot', circled in yellow with a red '2' next to it.
- Description:** A text input field.
- Use snapshot as a source:** A dropdown menu showing 'vol1-snapshot (1 GiB)', highlighted with a yellow box and a red '3' next to it.
- Volume Type:** A dropdown menu showing 'No volume type'.
- Size (GiB):** A text input field containing '1'.
- Volume Limits:** A section showing 'Total Gibibytes (2 GiB)' with a progress bar and '1,000 GiB Available', and 'Number of Volumes (1)' with a progress bar and '10 Available'.
- Buttons:** A 'Cancel' button and a 'Create Volume' button, both circled in yellow with a red '4' next to them.

In the background, the 'Volumes' tab is selected in the left sidebar. The 'Actions' column in the table below the dialog box shows a 'Create Volume' button, circled in yellow with a red '1' next to it.

# Create Volume from Image



Volumes - OpenStack Dashboard

10.0.0.11/horizon/project/volumes/

openstack sales-crm

Project / Compute

Volume

Overview

Instances

Volumes

Images

Access & Security

Network

Orchestration

Object Store

Identity

Name

encrypted-vol

vol1

Displaying 2 items

### Create Volume

**Volume Name**

bootable-volume

**Description**

**Volume Source**

Image

**Use image as a source**

Choose an image

- Choose an image
- devOS-3.5 (12.7 MB)
- cirros (12.7 MB)

**Size (GiB)**

1

**Description:**

Volumes are block devices that can be attached to instances.

**Volume Type Description:**

If "No volume type" is selected, the volume will be created without a volume type.

**Volume Limits**

**Total Gibibytes (3 GiB)** 1,000 GiB Available

**Number of Volumes (2)** 10 Available

Cancel Create Volume

| Volume    | Accept Transfer | Delete Volumes |
|-----------|-----------------|----------------|
| bootable  | No              | No             |
| encrypted | No              | No             |

Actions

Edit Volume

# Create Volume Type

Volumes - OpenStack Dashboard

10.0.0.11/horizon/admin/volumes/

openstack admin

Project Admin System Overview Hypervisors Host Aggregates Instances Volumes Flavours Images Networks Routers Floating IPs Defaults Metadata Definitions System Information Identity

Admin / System / Volumes

## Volumes

Volume Types Volume Snapshots

### Volume Types

Filter

2 + Create Volume Type

| Name                 | Description | Associated QoS Spec | Encryption | Public | Actions |
|----------------------|-------------|---------------------|------------|--------|---------|
| No items to display. |             |                     |            |        |         |

1 Volumes

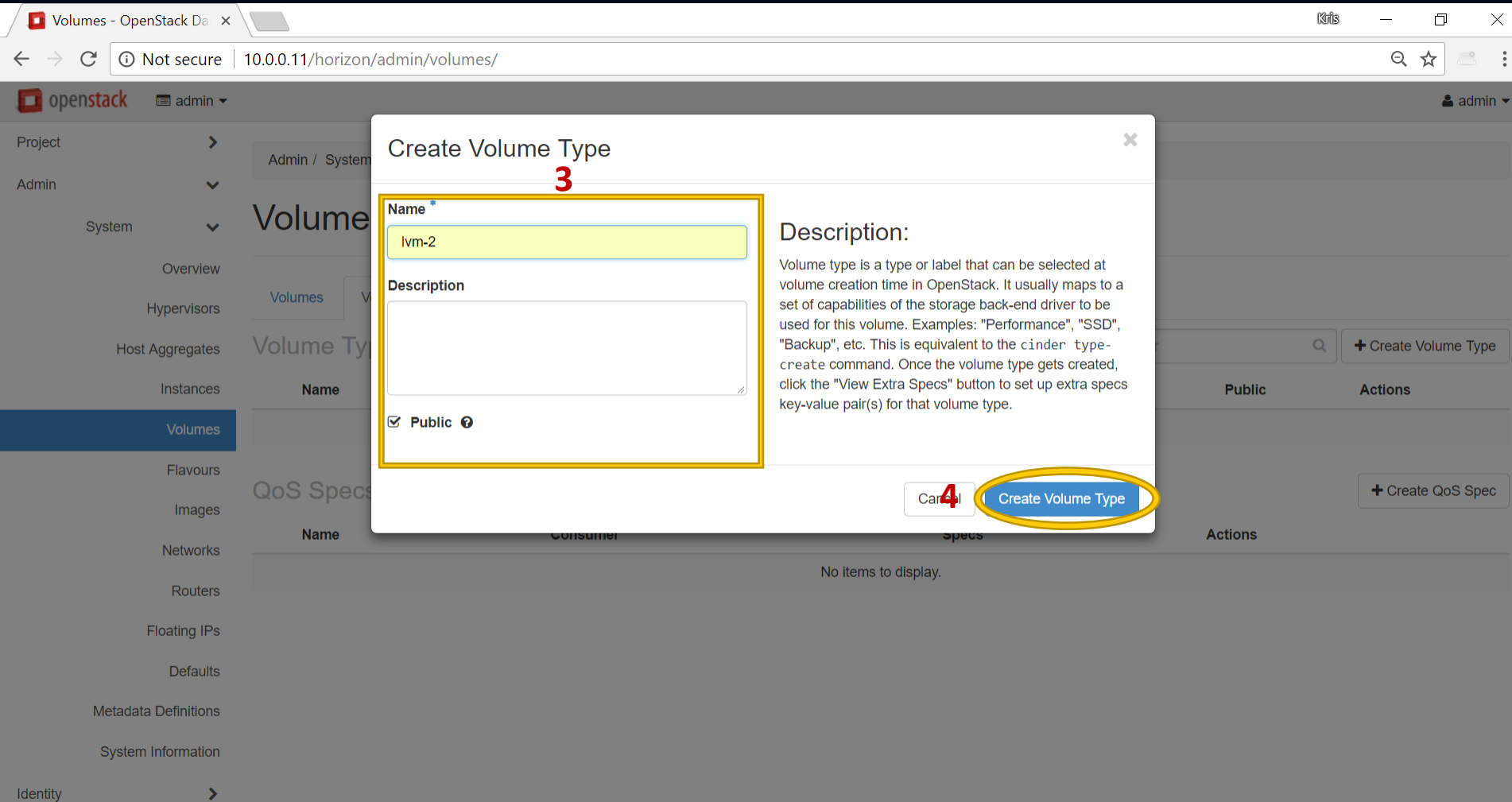
### QoS Specs

+ Create QoS Spec

| Name                 | Consumer | Specs | Actions |
|----------------------|----------|-------|---------|
| No items to display. |          |       |         |



# Create Volume Type



Volumes - OpenStack Dashboard

10.0.0.11/horizon/admin/volumes/

openstack admin

Project Admin System

Overview Hypervisors Host Aggregates Instances Volumes

Flavours Images Networks Routers Floating IPs Defaults Metadata Definitions System Information Identity

## Create Volume Type

**3**

Name: lvm-2

Description:

☐ Public

**4** Cancel Create Volume Type

Description: Volume type is a type or label that can be selected at volume creation time in OpenStack. It usually maps to a set of capabilities of the storage back-end driver to be used for this volume. Examples: "Performance", "SSD", "Backup", etc. This is equivalent to the cinder type-create command. Once the volume type gets created, click the "View Extra Specs" button to set up extra specs key-value pair(s) for that volume type.

Public Actions

+ Create Volume Type

+ Create QoS Spec

No items to display.

# Enable Multiple Backends

Volumes - OpenStack Dashboard

10.0.0.11/horizon/admin/volumes/?tab=volumes\_group\_tabs\_\_volume\_types\_tab

openstack admin

Project > Admin > System > Overview > Hypervisors > Host Aggregates > Instances > **Volumes** > Flavours > Images > Networks > Routers > Floating IPs > Defaults > Metadata Definitions > System Information > Identity >

Admin / System / Volumes

## Volumes

Volumes Volume Types Volume Snapshots

### Volume Types

Filter + Create Volume Type Delete Volume Types

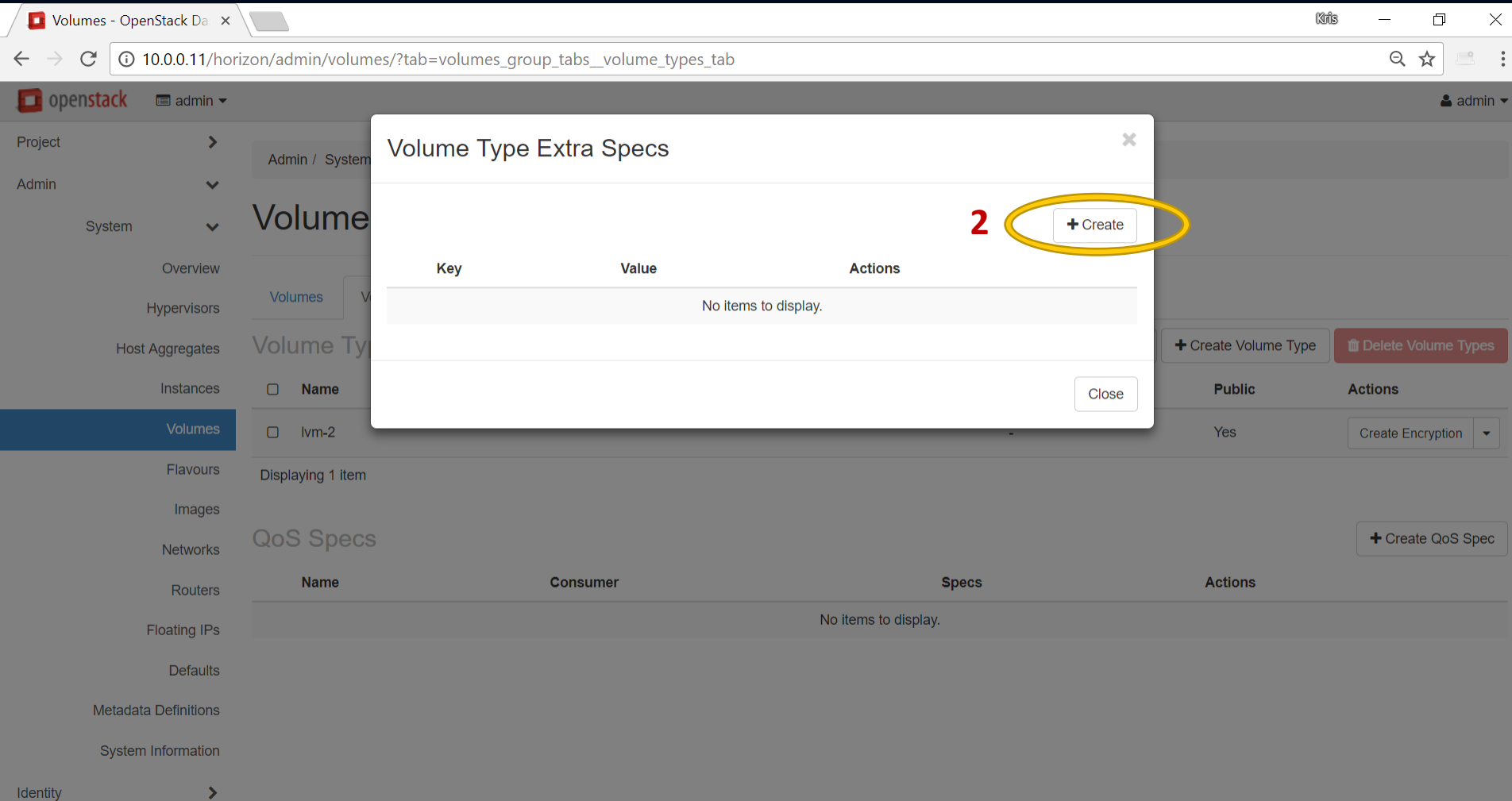
| Name  | Description | Associated QoS Spec | Encryption | Public | Actions   |
|-------|-------------|---------------------|------------|--------|---|
| lvm-2 |             |                     | -          | Yes    | <a href="#">View Extra Specs</a><br><a href="#">Manage QoS Spec Association</a><br><a href="#">Edit Volume Type</a><br><a href="#">Delete Volume Type</a> |

Displaying 1 item

### QoS Specs

| Name                 | Consumer | Specs | Actions |
|----------------------|----------|-------|---------|
| No items to display. |          |       |         |

# Enable Multiple Backends



The screenshot shows the OpenStack Horizon admin interface. A modal dialog titled "Volume Type Extra Specs" is open in the center. Inside the dialog, there is a table with columns "Key", "Value", and "Actions". The table is currently empty, displaying "No items to display." To the right of the table, there is a red number "2" and a "+ Create" button, which is circled in yellow. Below the table is a "Close" button. In the background, the "Volumes" section is visible, showing a table for "Volume Types" with columns "Name", "Consumer", "Specs", and "Actions". The table has one row with "Name" "lvm-2" and "Public" "Yes". To the right of the table are buttons for "+ Create Volume Type" and "Delete Volume Types". Below the table is a "QoS Specs" section with a "+ Create QoS Spec" button.

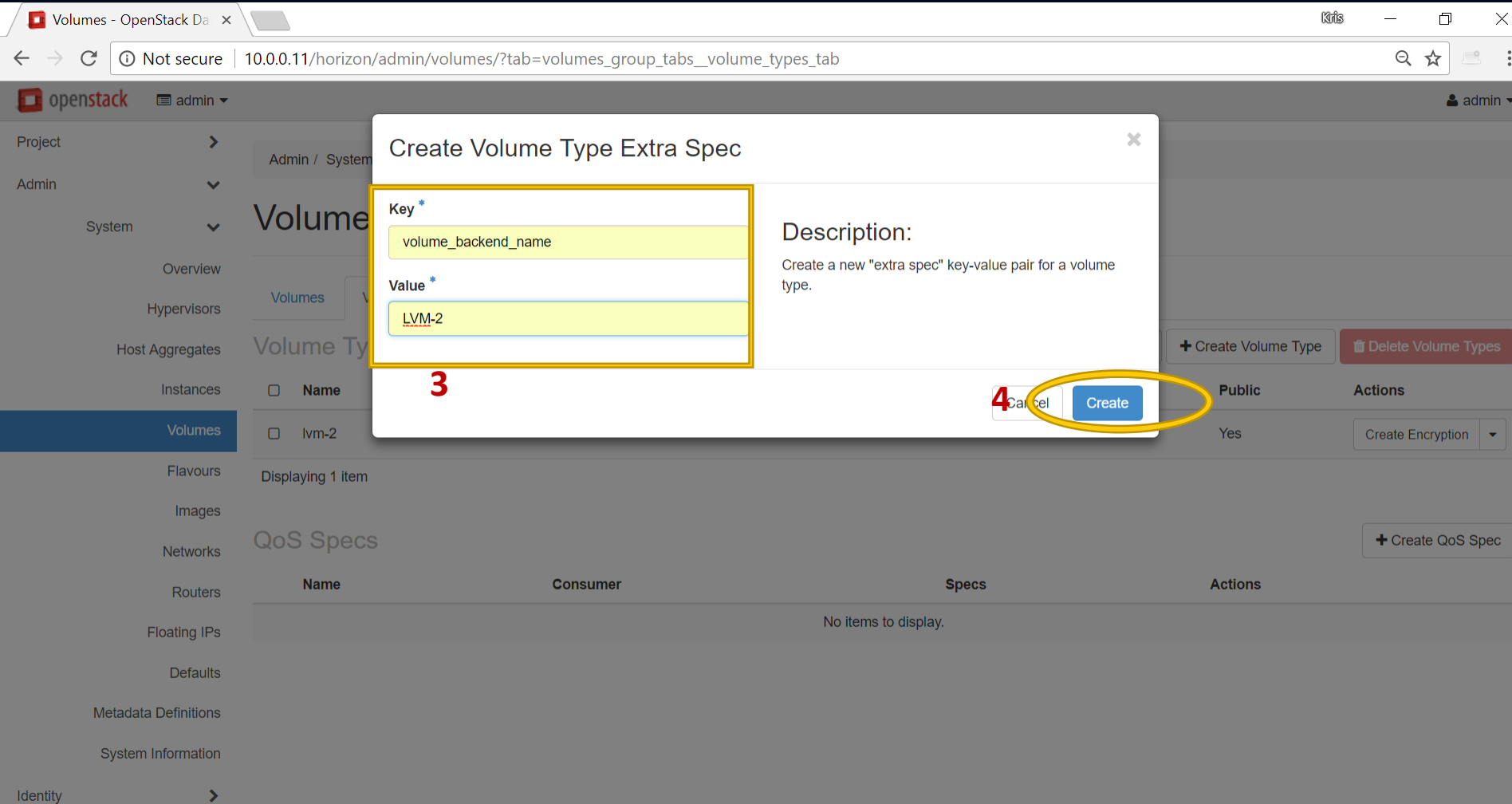
# Enable Multiple Backends

```

root@coa-lab: /var/log/cinder
[DEFAULT]
rootwrap_config = /etc/cinder/rootwrap
api_paste_config = /etc/cinder/api-paste
iscsi_helper = tgtadm
volume_name_template = volume-%s
volume_group = cinder-volumes
verbose = True
auth_strategy = keystone
state_path = /var/lib/cinder
lock_path = /var/lock/cinder
volumes_dir = /var/lib/cinder/volumes
transport_url = rabbit://openstack:op
my_ip = 10.0.0.11
glance_host = 10.0.0.11
control_exchange = cinder
notification_driver = cinder.openstack
glance_api_servers = http://controller
enabled_backends = lvm, lvm-2
backup_driver = cinder.backup.drivers
backup_metadata_version = 2
backup_compression_algorithm = zlib
backup_swift_auth = per_user
backup_swift_container = volumebackups
backup_swift_retry_attempts = 3
backup_swift_retry_backoff = 2
[database]
connection = mysql+pymysql://cinder:openstack@controller/cinder
[keystone_auth_token]
auth_uri = http://controller:5000
auth_url = http://controller:35357
memcached_servers = controller:11211
auth_type = password
project_domain_name = Default
user_domain_name = Default
username = cinder
password = openstack
[oslo_concurrency]
lock_path = /var/lib/cinder/tmp
[keymgr]
fixed_key = 99636535482328266092631578146153435176227864197841817665
encryption_auth_url = http://10.0.0.11:5000/v3
[lvm]
volume_driver = cinder.volume.drivers.lvm.LVMVolumeDriver
volume_group = cinder-volumes
volume_backend_name = LVM
iscsi_protocol = iscsi
iscsi_helper = tgtadm
[lvm-2]
volume_driver = cinder.volume.drivers.lvm.LVMVolumeDriver
volume_group = cinder-volumes-2
volume_backend_name = LVM-2
iscsi_protocol = iscsi
iscsi_helper = tgtadm
"/etc/cinder/cinder.conf" 54L, 1678C

```

# Enable Multiple Backends



Volumes - OpenStack Da x

10.0.0.11/horizon/admin/volumes/?tab=volumes\_group\_tabs\_\_volume\_types\_tab

openstack admin

Project > Admin > System > Volumes

Volume Type

Key \*

volume\_backend\_name

Value \*

LVM-2

3

Description:

Create a new "extra spec" key-value pair for a volume type.

4 Cancel Create

+ Create Volume Type Delete Volume Types

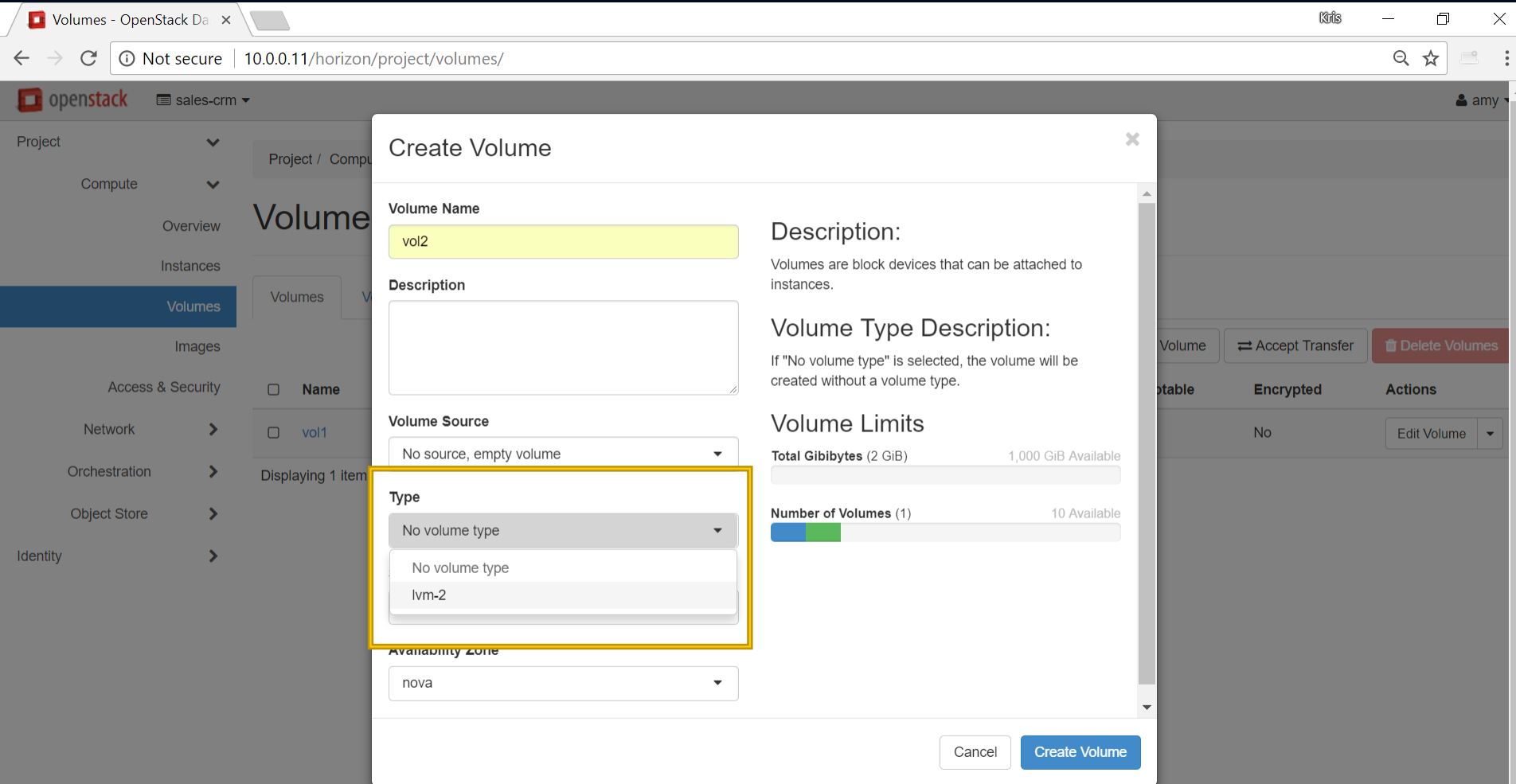
Public Actions

Yes Create Encryption

+ Create QoS Spec

| Name                 | Consumer | Specs | Actions |
|----------------------|----------|-------|---------|
| No items to display. |          |       |         |

# Enable Multiple Backends



Volumes - OpenStack Dashboard

10.0.0.11/horizon/project/volumes/

openstack sales-crm

Project / Compute

Volume

Overview

Instances

Volumes

Images

Access & Security

Network

Orchestration

Object Store

Identity

Name

vol1

Displaying 1 item

### Create Volume

**Volume Name**

vol2

**Description**

**Volume Source**

No source, empty volume

**Type**

- No volume type
- No volume type
- lvm-2

**Availability Zone**

nova

**Description:**

Volumes are block devices that can be attached to instances.

**Volume Type Description:**

If "No volume type" is selected, the volume will be created without a volume type.

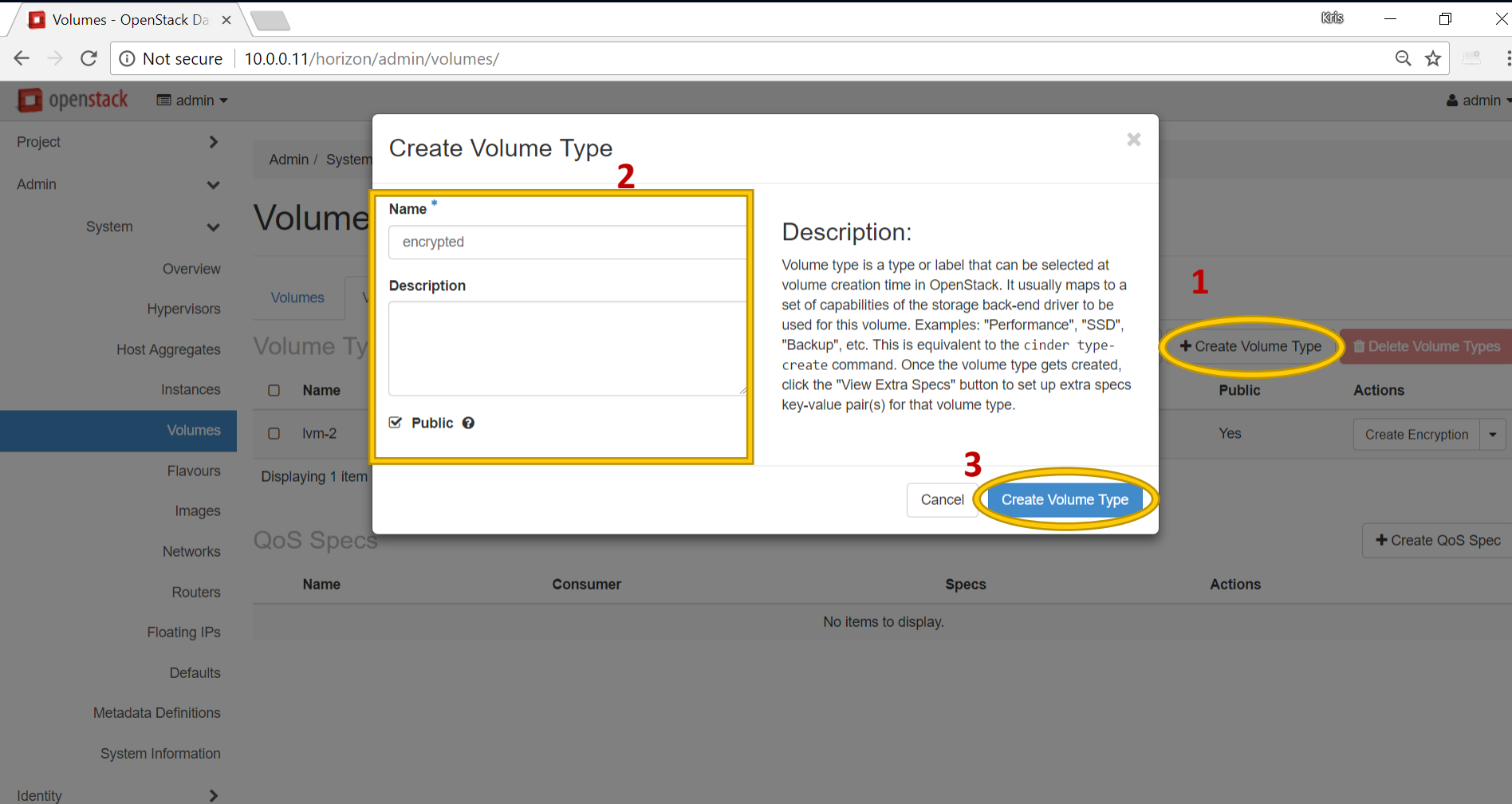
**Volume Limits**

**Total Gibibytes (2 GiB)** 1,000 GiB Available

**Number of Volumes (1)** 10 Available

Cancel Create Volume

# Create Volume Encryption



The screenshot shows the OpenStack Horizon admin interface. A modal dialog titled "Create Volume Type" is open. The dialog has a "Name" field with the value "encrypted", a "Description" field, and a "Public" checkbox that is checked. The background interface shows the "Volumes" section with a table of volume types and a "+ Create Volume Type" button circled in yellow. The table has columns for "Name", "Consumer", "Specs", and "Actions". The "Actions" column contains a "Create Encryption" button. The "Public" checkbox is also circled in yellow.

**Create Volume Type**

Name

Description

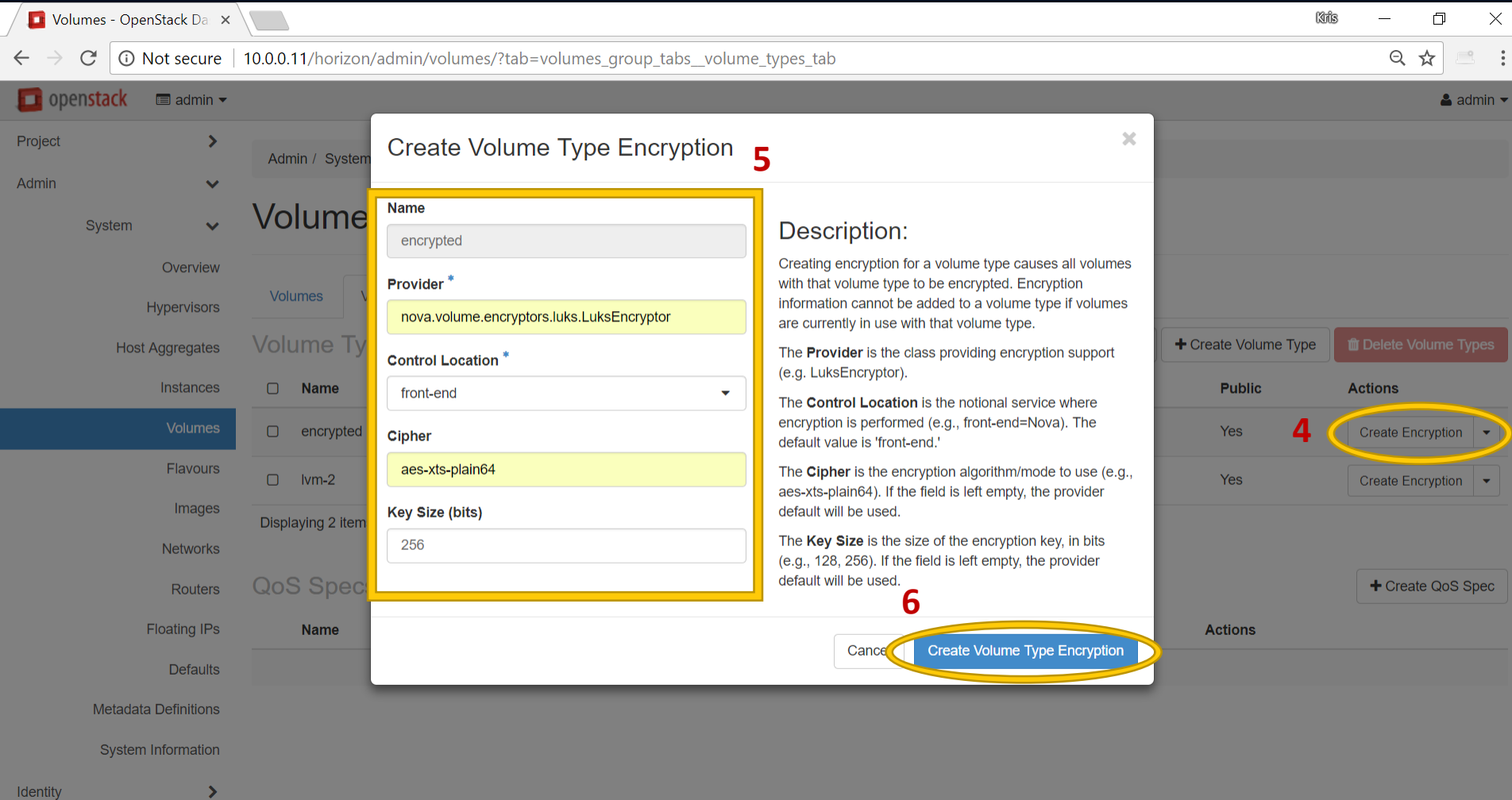
☒ Public

Cancel **Create Volume Type**

**Volume Types**

| Name      | Consumer | Specs | Actions           |
|-----------|----------|-------|-------------------|
| encrypted |          |       | Create Encryption |

# Create Volume Encryption



Volumes - OpenStack Dashboard

10.0.0.11/horizon/admin/volumes/?tab=volumes\_group\_tabs\_\_volume\_types\_tab

openstack admin

Project Admin System

Volume Types

Instances Volumes

Flavours Images Networks Routers Floating IPs Defaults Metadata Definitions System Information Identity

Admin / System

Volume Type

Displaying 2 items

QoS Specifications

Name

encrypted

Provider \*

nova.volume.encryptors.luks.LuksEncryptor

Control Location \*

front-end

Cipher

aes-xts-plain64

Key Size (bits)

256

Description:

Creating encryption for a volume type causes all volumes with that volume type to be encrypted. Encryption information cannot be added to a volume type if volumes are currently in use with that volume type.

The **Provider** is the class providing encryption support (e.g. LuksEncryptor).

The **Control Location** is the notional service where encryption is performed (e.g., front-end=Nova). The default value is 'front-end.'

The **Cipher** is the encryption algorithm/mode to use (e.g., aes-xts-plain64). If the field is left empty, the provider default will be used.

The **Key Size** is the size of the encryption key, in bits (e.g., 128, 256). If the field is left empty, the provider default will be used.

Cancel Create Volume Type Encryption

+ Create Volume Type Delete Volume Types

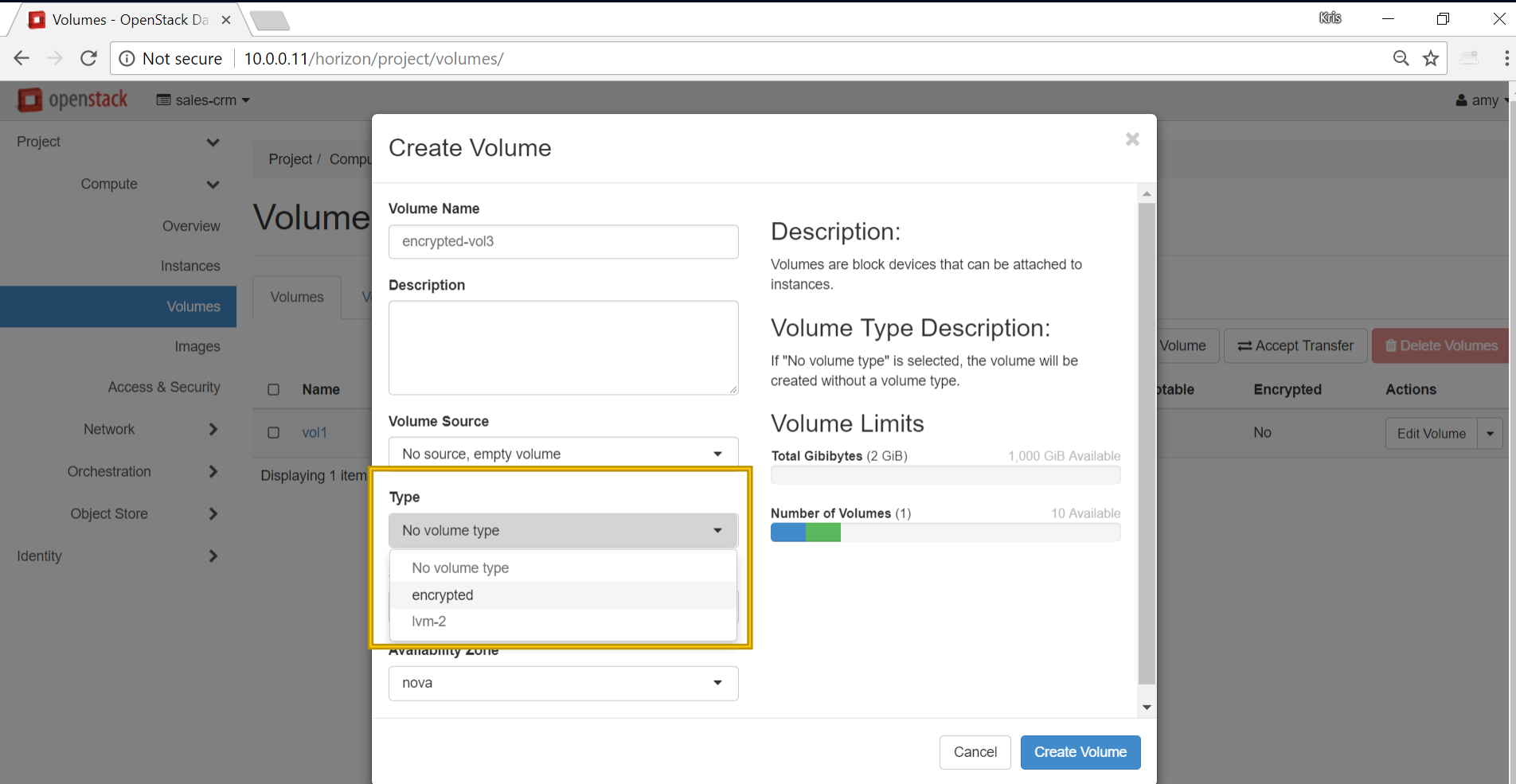
| Public | Actions           |
|--------|-------------------|
| Yes    | Create Encryption |
| Yes    | Create Encryption |

+ Create QoS Spec

Actions



# Create Volume Encryption



Volumes - OpenStack Dashboard

10.0.0.11/horizon/project/volumes/

openstack sales-crm

Project / Compute

Volume

Overview

Instances

Volumes

Images

Access & Security

Network

Orchestration

Object Store

Identity

Name

vol1

Displaying 1 item

### Create Volume

**Volume Name**

encrypted-vol3

**Description**

**Volume Source**

No source, empty volume

**Type**

- No volume type
- encrypted
- lvm-2

**Availability Zone**

nova

**Description:**

Volumes are block devices that can be attached to instances.

**Volume Type Description:**

If "No volume type" is selected, the volume will be created without a volume type.

**Volume Limits**

Total Gibibytes (2 GiB) 1,000 GiB Available

Number of Volumes (1) 10 Available

Cancel Create Volume

# Create Volume Transfer

Volumes - OpenStack Dashboard

10.0.0.11/horizon/project/volumes/

openstack sales-crm amy

Project / Compute / Volumes

Volumes

1

Volumes

Filter

+ Create Volume

= Accept Transfer

Delete Volumes

| Name           | Description | Size | Status    | Type | Attached To | Availability Zone | Bootable | Encrypted | Actions     |
|----------------|-------------|------|-----------|------|-------------|-------------------|----------|-----------|-------------|
| encrypted-vol3 | -           | 1GiB | Available | -    |             | nova              | No       | No        | Edit Volume |
| vol1           | -           | 1GiB | Available | -    |             | nova              | No       | No        | Edit Volume |

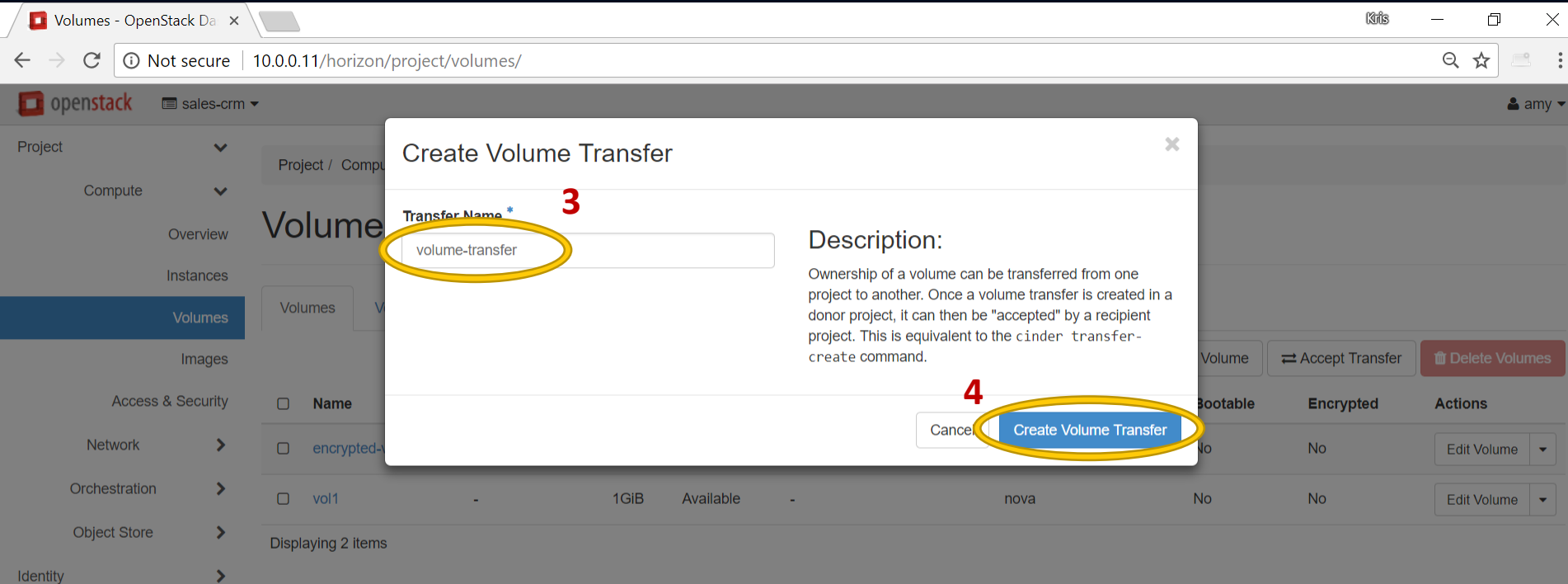
Displaying 2 items

2

Create Transfer

10.0.0.11/horizon/project/volumes/#

# Create Volume Transfer



Volumes - OpenStack Dashboard

10.0.0.11/horizon/project/volumes/

Project / Compute

Volume

Transfer Name \*

volume-transfer

Description:

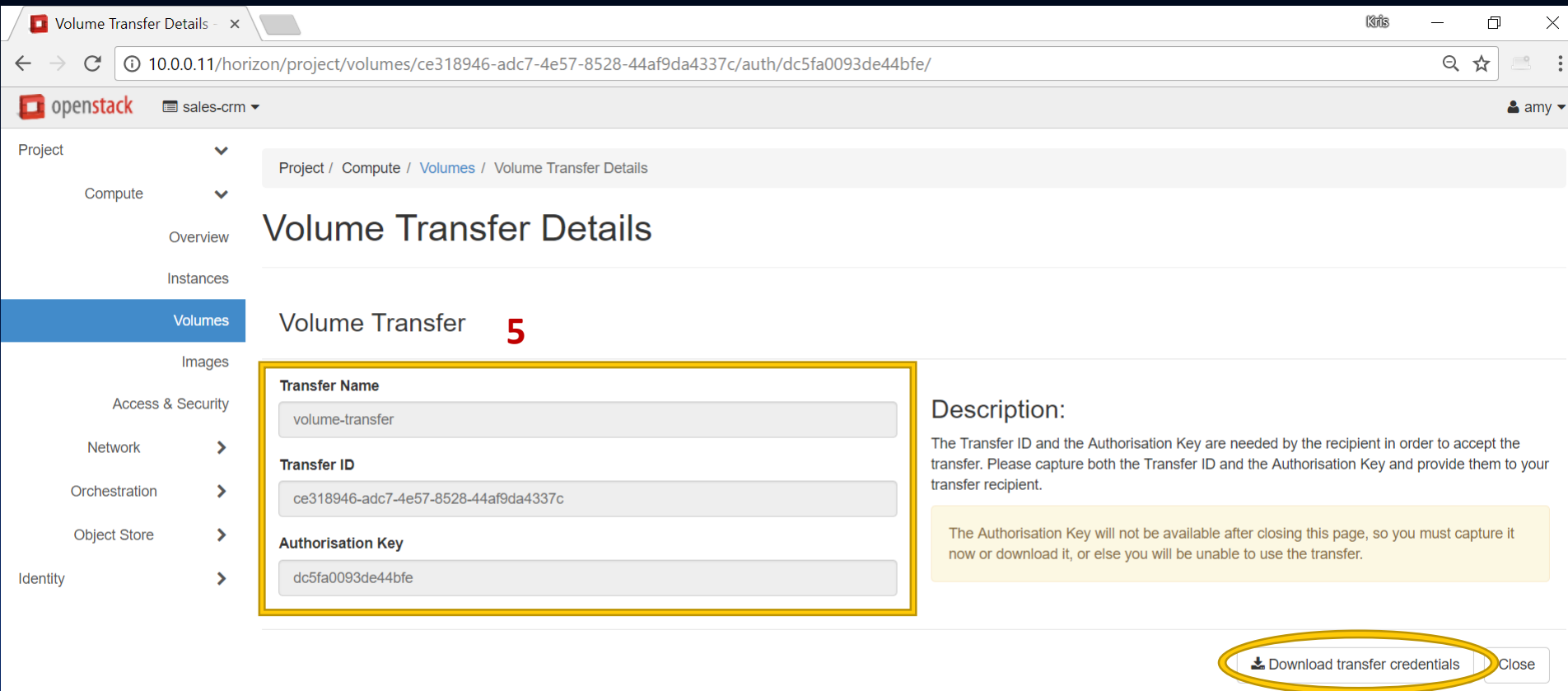
Ownership of a volume can be transferred from one project to another. Once a volume transfer is created in a donor project, it can then be "accepted" by a recipient project. This is equivalent to the `cinder transfer-create` command.

Cancel Create Volume Transfer

| Name       | Size | Status    | Backend | Bootable | Encrypted | Actions     |
|------------|------|-----------|---------|----------|-----------|-------------|
| encrypted- |      |           |         | No       | No        | Edit Volume |
| vol1       | 1GiB | Available | nova    | No       | No        | Edit Volume |

Displaying 2 items

# Create Volume Transfer



Volume Transfer Details - x

10.0.0.11/horizon/project/volumes/ce318946-adc7-4e57-8528-44af9da4337c/auth/dc5fa0093de44bfe/

openstack sales-crm amy

Project / Compute / Volumes / Volume Transfer Details

## Volume Transfer Details

Volume Transfer **5**

**Transfer Name**  
volume-transfer

**Transfer ID**  
ce318946-adc7-4e57-8528-44af9da4337c

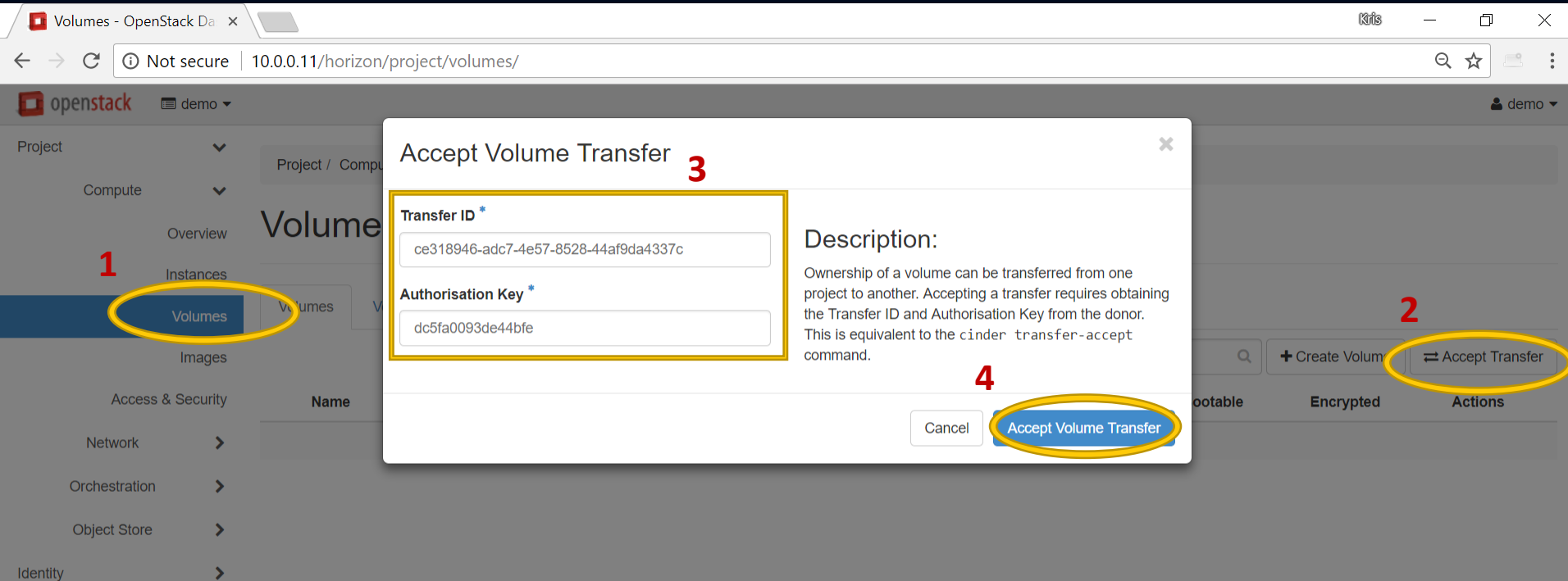
**Authorisation Key**  
dc5fa0093de44bfe

**Description:**  
The Transfer ID and the Authorisation Key are needed by the recipient in order to accept the transfer. Please capture both the Transfer ID and the Authorisation Key and provide them to your transfer recipient.

The Authorisation Key will not be available after closing this page, so you must capture it now or download it, or else you will be unable to use the transfer.

[Download transfer credentials](#) Close

# Accept Volume Transfer



The screenshot shows the OpenStack Horizon interface. The left sidebar has a red '1' next to the 'Volumes' tab, which is circled in yellow. The main content area shows a modal dialog titled 'Accept Volume Transfer' with a red '3' next to the title. The dialog contains two input fields: 'Transfer ID' with the value 'ce318946-adc7-4e57-8528-44af9da4337c' and 'Authorisation Key' with the value 'dc5fa0093de44bfe'. A red '4' is next to the 'Accept Volume Transfer' button at the bottom right of the dialog. In the background, the 'Accept Transfer' button in the volume actions column is circled in yellow with a red '2' next to it.

Volumes - OpenStack Dashboard

Not secure | 10.0.0.11/horizon/project/volumes/

openstack demo

Project / Compute

Overview

Instances

Volumes

Images

Access & Security

Network

Orchestration

Object Store

Identity

Accept Volume Transfer

Transfer ID \*

ce318946-adc7-4e57-8528-44af9da4337c

Authorisation Key \*

dc5fa0093de44bfe

Description:

Ownership of a volume can be transferred from one project to another. Accepting a transfer requires obtaining the Transfer ID and Authorisation Key from the donor. This is equivalent to the cinder transfer-accept command.

Cancel

Accept Volume Transfer

+ Create Volume

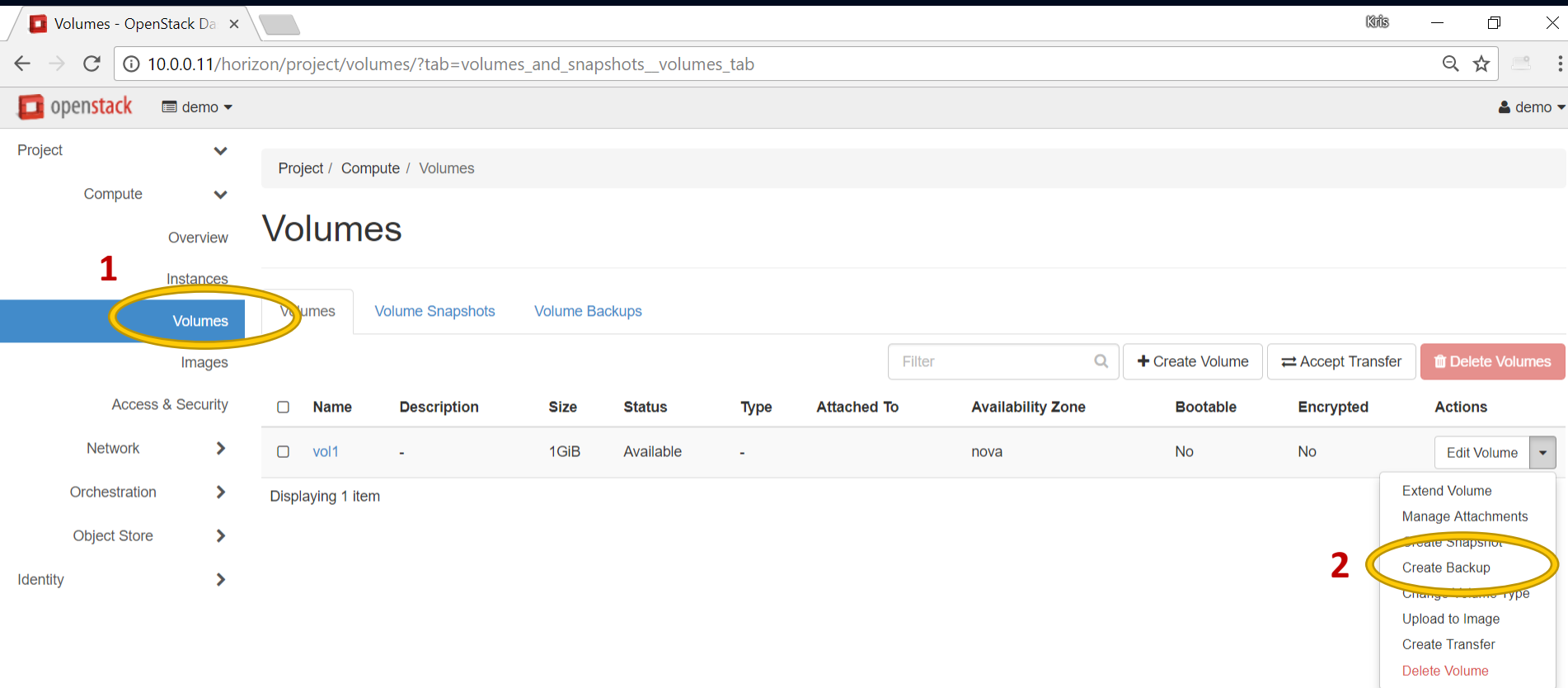
Accept Transfer

bootable

Encrypted

Actions

# Create a Volume Backup



The screenshot shows the OpenStack Horizon interface for managing volumes. The left sidebar has a red '1' next to the 'Volumes' tab, which is circled in yellow. The main content area shows a table of volumes with one volume named 'vol1'. The 'Actions' column for 'vol1' has a dropdown menu open, showing options like 'Extend Volume', 'Manage Attachments', 'Create Snapshot', 'Create Backup', 'Change Volume Type', 'Upload to Image', 'Create Transfer', and 'Delete Volume'. A red '2' points to the 'Create Backup' option, which is also circled in yellow.

Project / Compute / Volumes

## Volumes

1

Volumes

Volume Snapshots

Volume Backups

Filter

+ Create Volume

Accept Transfer

Delete Volumes

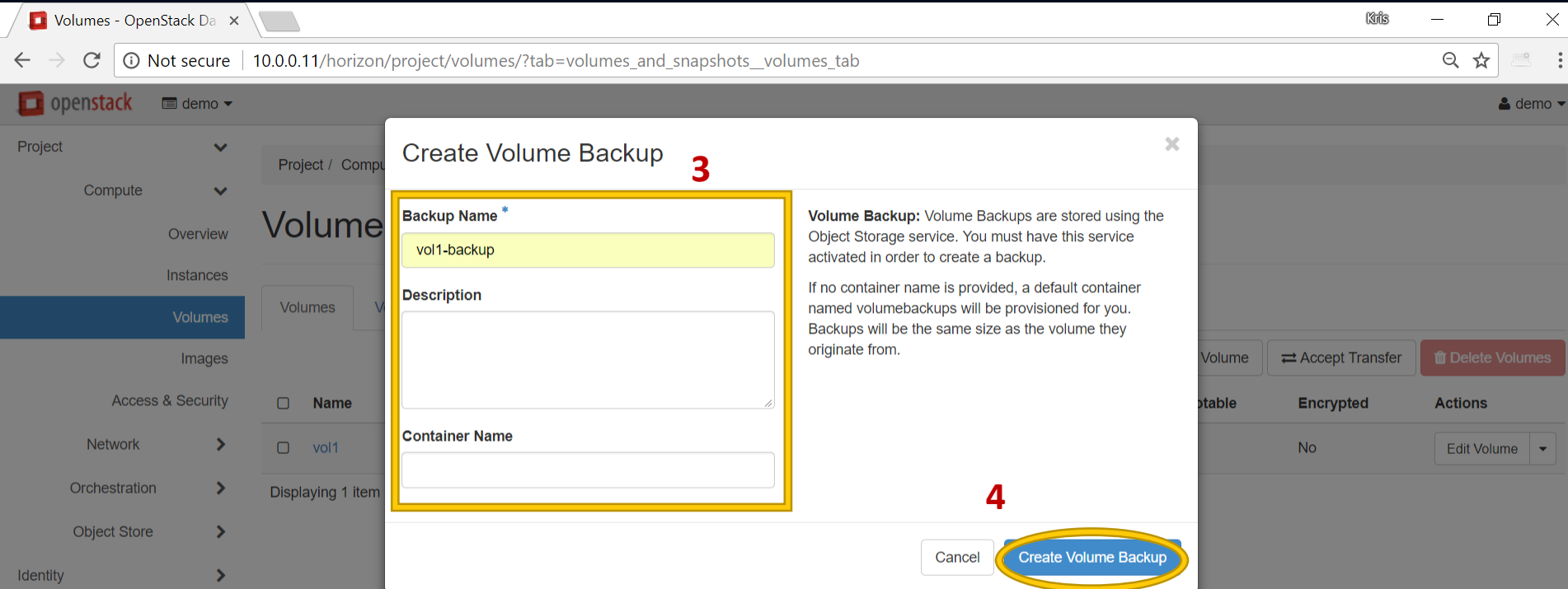
| Name | Description | Size | Status    | Type | Attached To | Availability Zone | Bootable | Encrypted | Actions     |
|------|-------------|------|-----------|------|-------------|-------------------|----------|-----------|-------------|
| vol1 | -           | 1GiB | Available | -    |             | nova              | No       | No        | Edit Volume |

Displaying 1 item

2

- Extend Volume
- Manage Attachments
- Create Snapshot
- Create Backup
- Change Volume Type
- Upload to Image
- Create Transfer
- Delete Volume

# Create a Volume Backup



Volumes - OpenStack Dashboard

10.0.0.11/horizon/project/volumes/?tab=volumes\_and\_snapshots\_volumes\_tab

openstack demo

Project / Compute

Volume

Backup Name \*

vol1-backup

Description

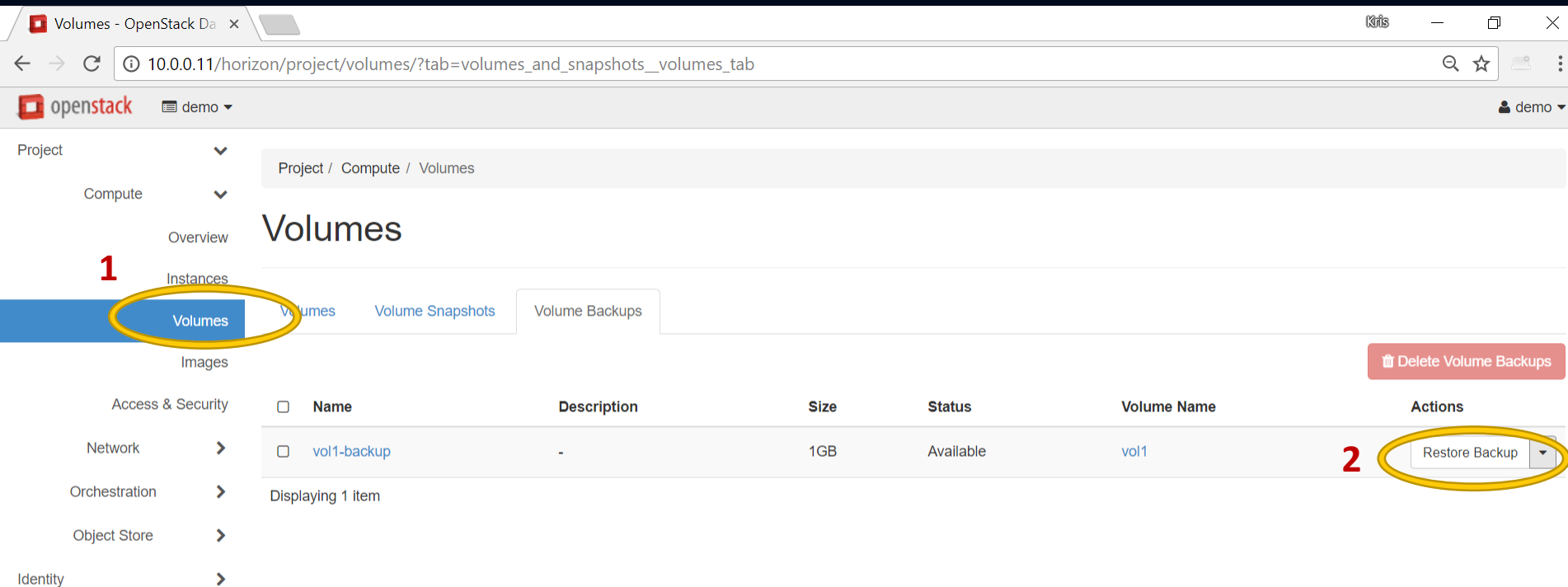
Container Name

**Volume Backup:** Volume Backups are stored using the Object Storage service. You must have this service activated in order to create a backup.

If no container name is provided, a default container named volumebackups will be provisioned for you. Backups will be the same size as the volume they originate from.

Cancel Create Volume Backup

# Restore a Volume Backup



The screenshot shows the OpenStack Horizon interface for managing volumes. The left sidebar has a menu with 'Volumes' highlighted, marked with a red '1' and a yellow circle. The main content area shows a table of volume backups. The first row is for 'vol1-backup', which is 1GB and available. The 'Actions' column for this row has a dropdown menu with 'Restore Backup' selected, marked with a red '2' and a yellow circle. A 'Delete Volume Backups' button is visible in the top right corner.

Project / Compute / Volumes

## Volumes

Overview  
Instances  
**Volumes**  
Volume Snapshots  
Volume Backups

Access & Security  
Network  
Orchestration  
Object Store  
Identity

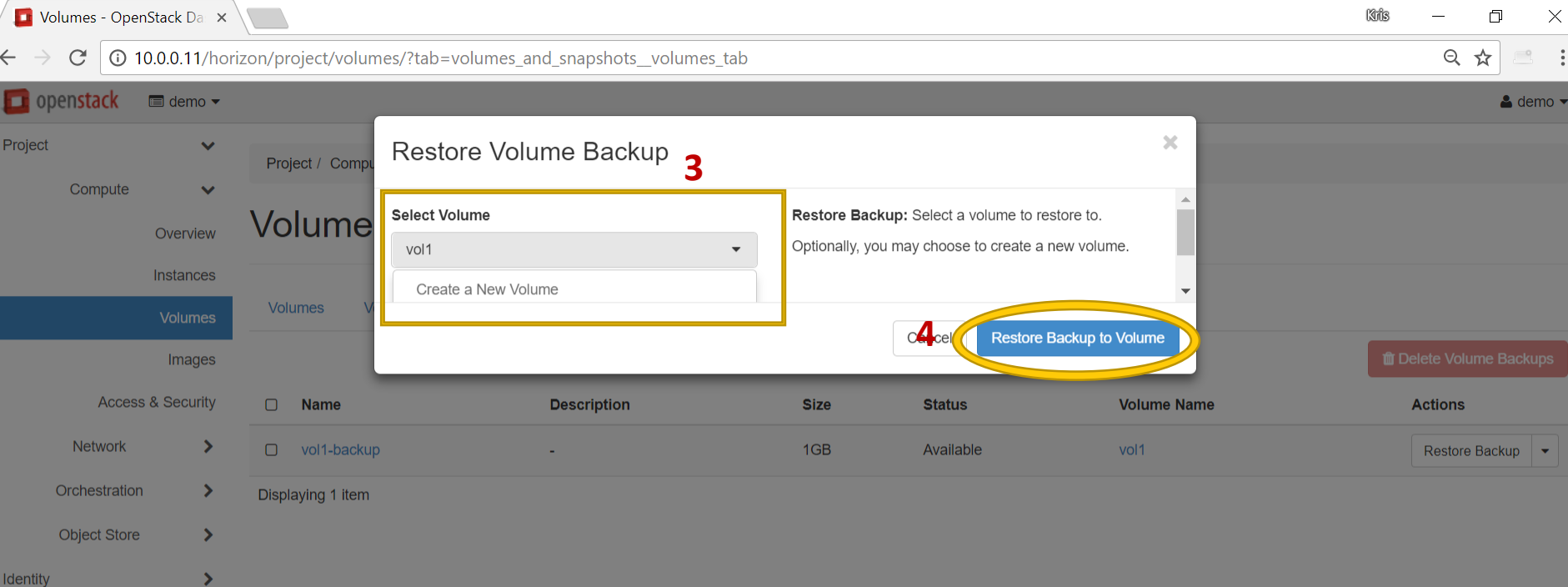
| Name                                 | Description | Size | Status    | Volume Name | Actions                                       |
|--------------------------------------|-------------|------|-----------|-------------|---|
| <input type="checkbox"/> vol1-backup | -           | 1GB  | Available | vol1        | <input type="button" value="Restore Backup"/> |

Displaying 1 item

Delete Volume Backups



# Restore a Volume Backup



Volumes - OpenStack Dashboard

10.0.0.11/horizon/project/volumes/?tab=volumes\_and\_snapshots\_volumes\_tab

openstack demo

Project / Compute

Volume

Overview

Instances

Volumes

Images

Access & Security

Network

Orchestration

Object Store

Identity

**Restore Volume Backup** 3

Select Volume

vol1

Create a New Volume

Restore Backup: Select a volume to restore to.  
Optionally, you may choose to create a new volume.

4 Cancel Restore Backup to Volume

Delete Volume Backups

| Name        | Description | Size | Status    | Volume Name | Actions        |
|-------------|-------------|------|-----------|-------------|----------------|
| vol1-backup | -           | 1GB  | Available | vol1        | Restore Backup |

Displaying 1 item

# CLI Review

```
$ openstack volume create --size <size in GB> \  
  --source <volume> | --image <image> | --snapshot <snap> \  
  --type <volume-type> --description "..." \  
  <volume-name>
```

```
$ openstack volume list
```

```
$ openstack volume list --all-projects --long
```

```
$ openstack volume show <volume>
```

```
$ openstack server add volume <instance> <volume>
```

# CLI Review

```
$ openstack server add volume <instance> <volume>
```

```
$ ssh <user>@<instance IP address>
```

```
$ sudo su
```

```
# fdisk -l
```

```
# mkfs.ext3 /dev/vdb
```

```
# mount /dev/vdb /mnt
```

```
...
```

```
# umount /dev/vdb
```

```
$ openstack server remove volume <instance> <volume>
```

# CLI Review

```
$ openstack snapshot create --name <snapshot-name> \  
  --description "..." --force \  
  <volume-name>
```

```
$ openstack snapshot list
```

```
$ openstack snapshot list --all-projects --long
```

```
$ openstack snapshot show <snapshot-name>
```

```
$ openstack volume create --snapshot <snapshot-name> \  
  --size <in GB> <restored-volume-name>
```

# CLI Review

```
$ openstack volume backup create --name <backup-name> \  
  --description "... " --force \  
  --snapshot <snapshot> --container <swift-container> \  
  <volume-name>
```

```
$ openstack volume backup list
```

```
$ openstack volume backup show <backup-name>
```

```
$ openstack volume backup restore <backup> <volume>
```

# CLI Review

```
$ cinder quota-defaults <project>
```

```
$ cinder quota-show <project>
```

```
$ cinder quota-usage <project>
```

```
$ cinder quota-update --volumes <volumes> \  
--snapshots <snapshots> --backups <backups> \  
--gigabytes <gigabytes> --volume-type <volume-type> \  
--consistencygroups <consistencygroups> \  
--per-volume-gigabytes <per-volume-gigabytes> \  
<project>
```

# CLI Review

```
$ cinder transfer-create --name <transfer-name> <volume>
```

```
$ cinder transfer-accept <transfer-id> <auth-key>
```

```
$ cinder transfer-list --all-tenants
```

```
$ cinder transfer-show
```

```
$ cinder transfer-delete <transfer-id>
```

# CLI Review

```
$ openstack volume type create \  
  --property volume_backend_name=<backend-name> <type-name>  
  
$ openstack volume type create <encrypted-volume-type-name>  
$ cinder encryption-type-create --key_size 256 \  
  --cipher aes-xts-plain64 \  
  --control-location <front-end | back-end> \  
  <encrypted-volume-type-name> \  
  nova.volume.encryptors.luks.LuksEncryptor  
  
$ openstack volume create --size 1 --type <type> <volume>
```



# CLI Review

```
$ cinder get-capabilities <host@backend>
```

```
$ cinder get-pools --detail
```

```
$ openstack volume service list --long
```

Preparing to **Certified OpenStack Administrator** Exam

## Section 7 – Cinder Block Storage

*Lecture 30. Cinder Summary and Review*

# Thank you!