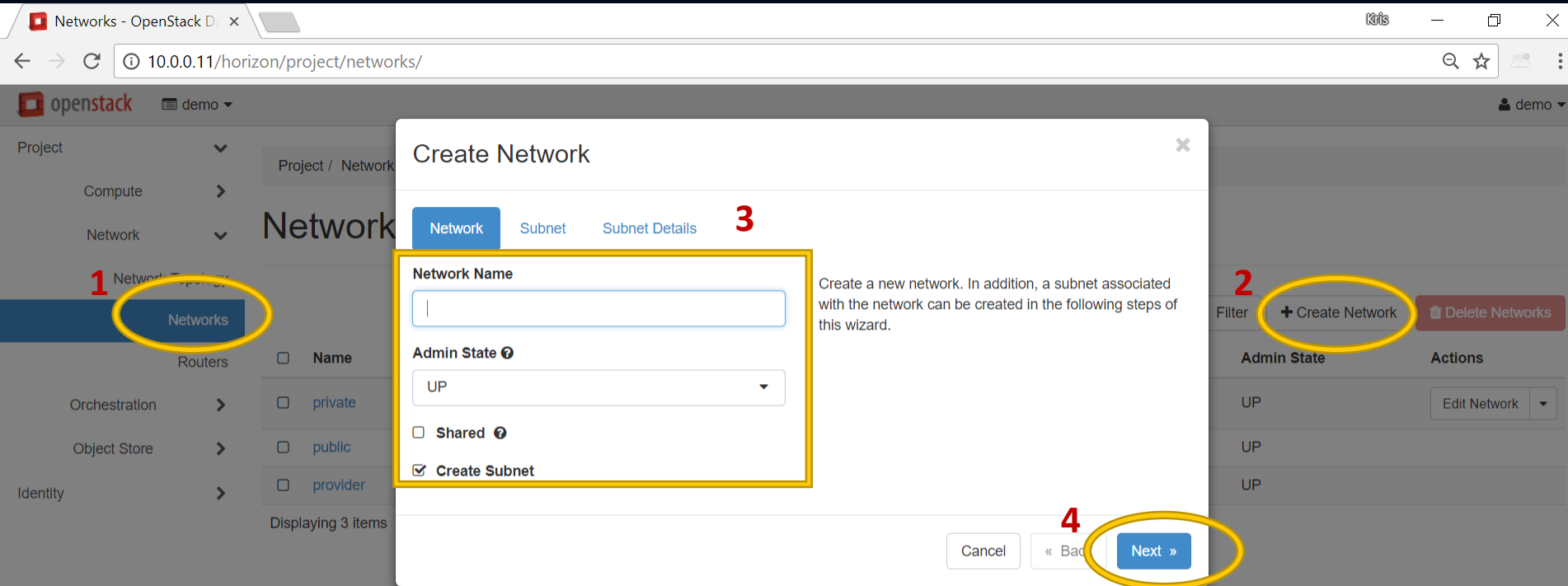


Preparing to **Certified OpenStack Administrator** Exam

Section 8 – OpenStack Network Service

Lecture 35. Neutron Summary and Review

Create a Project Network



Networks - OpenStack D x

10.0.0.11/horizon/project/networks/

openstack demo

Project / Network

Network

1 Network

Networks

Routers

Orchestration

Object Store

Identity

Displaying 3 items

Create Network

Network Subnet Subnet Details 3

Network Name

Admin State ? UP

☐ Shared ?

☒ Create Subnet

Create a new network. In addition, a subnet associated with the network can be created in the following steps of this wizard.

2 + Create Network Delete Networks

Admin State Actions

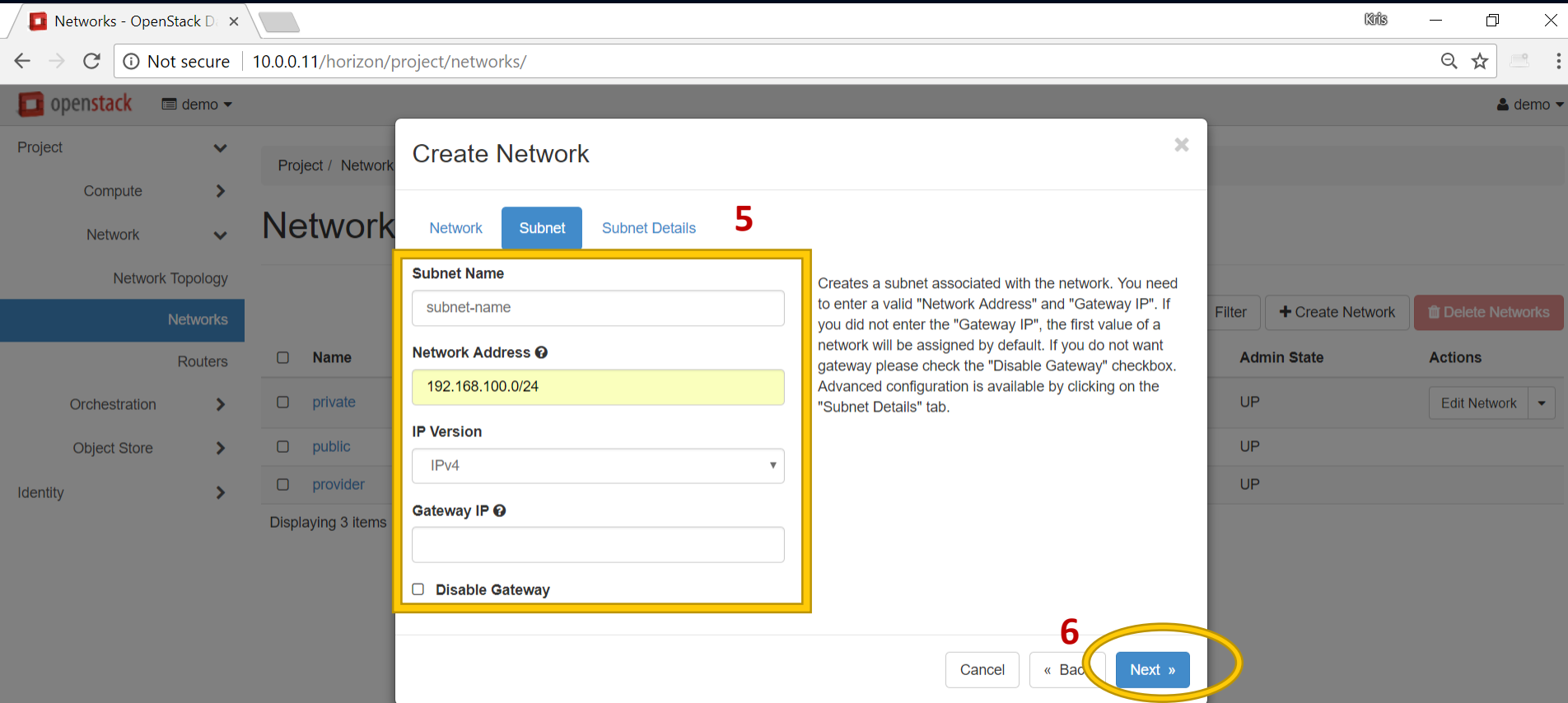
UP Edit Network

UP

UP

4 Cancel « Back Next »

Create a Project Network



Networks - OpenStack D x

10.0.0.11/horizon/project/networks/

openstack demo

Project / Network

Network

Network Topology

Networks

Routers

Orchestration

Object Store

Identity

Displaying 3 items

Create Network

Network Subnet Subnet Details **5**

Subnet Name

subnet-name

Network Address ⓘ

192.168.100.0/24

IP Version

IPv4

Gateway IP ⓘ

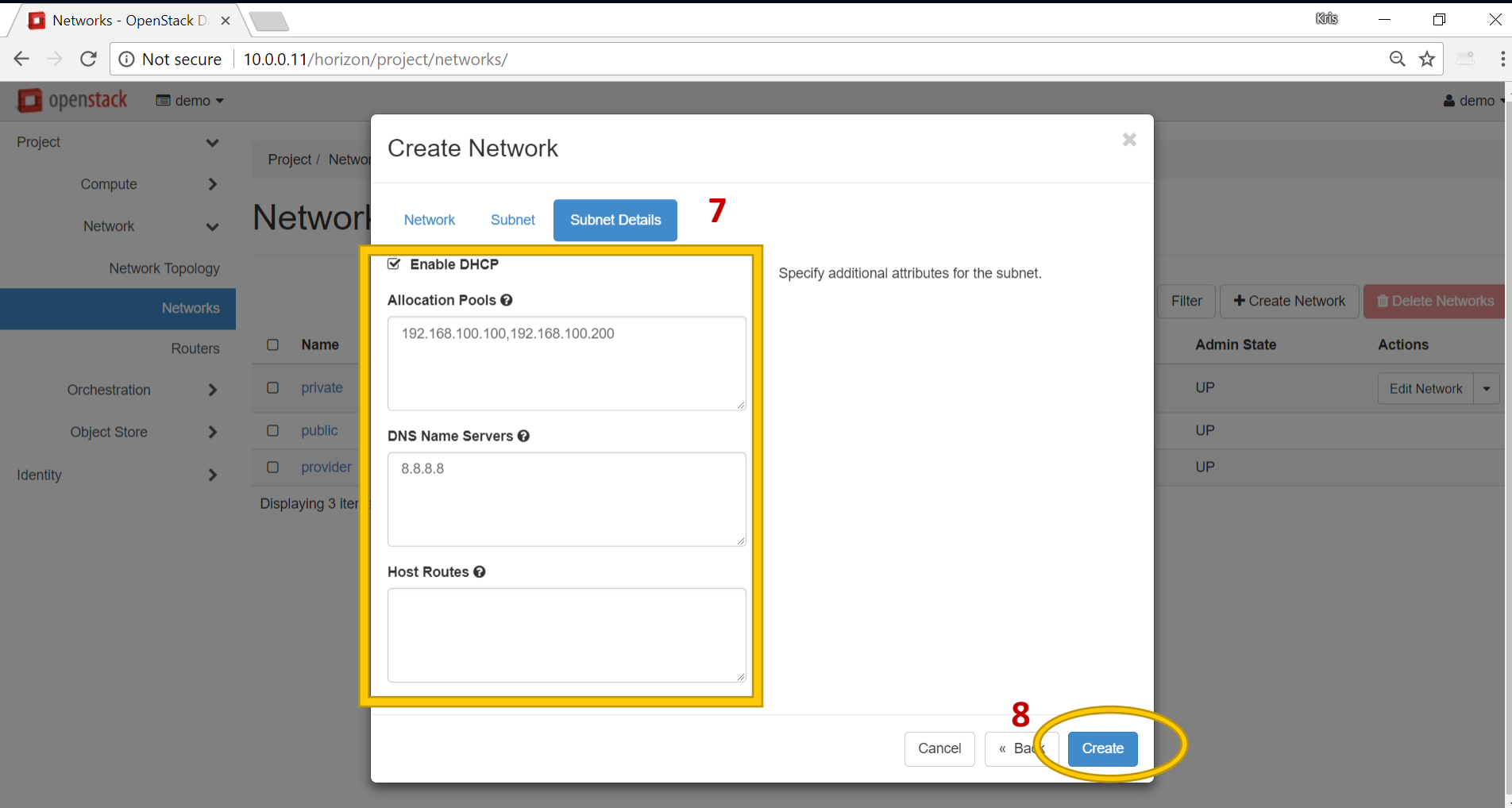
☐ **Disable Gateway**

Creates a subnet associated with the network. You need to enter a valid "Network Address" and "Gateway IP". If you did not enter the "Gateway IP", the first value of a network will be assigned by default. If you do not want gateway please check the "Disable Gateway" checkbox. Advanced configuration is available by clicking on the "Subnet Details" tab.

6

Cancel « Back Next »

Create a Project Network



Networks - OpenStack D x

10.0.0.11/horizon/project/networks/

openstack demo

Project / Network

Network

Network Topology

Networks

Routers

Orchestration

Object Store

Identity

Displaying 3 items

Create Network

Network Subnet Subnet Details **7**

☒ **Enable DHCP**

Allocation Pools ?

192.168.100.100,192.168.100.200

DNS Name Servers ?

8.8.8.8

Host Routes ?

Specify additional attributes for the subnet.

Filter + Create Network Delete Networks

Admin State Actions

UP Edit Network

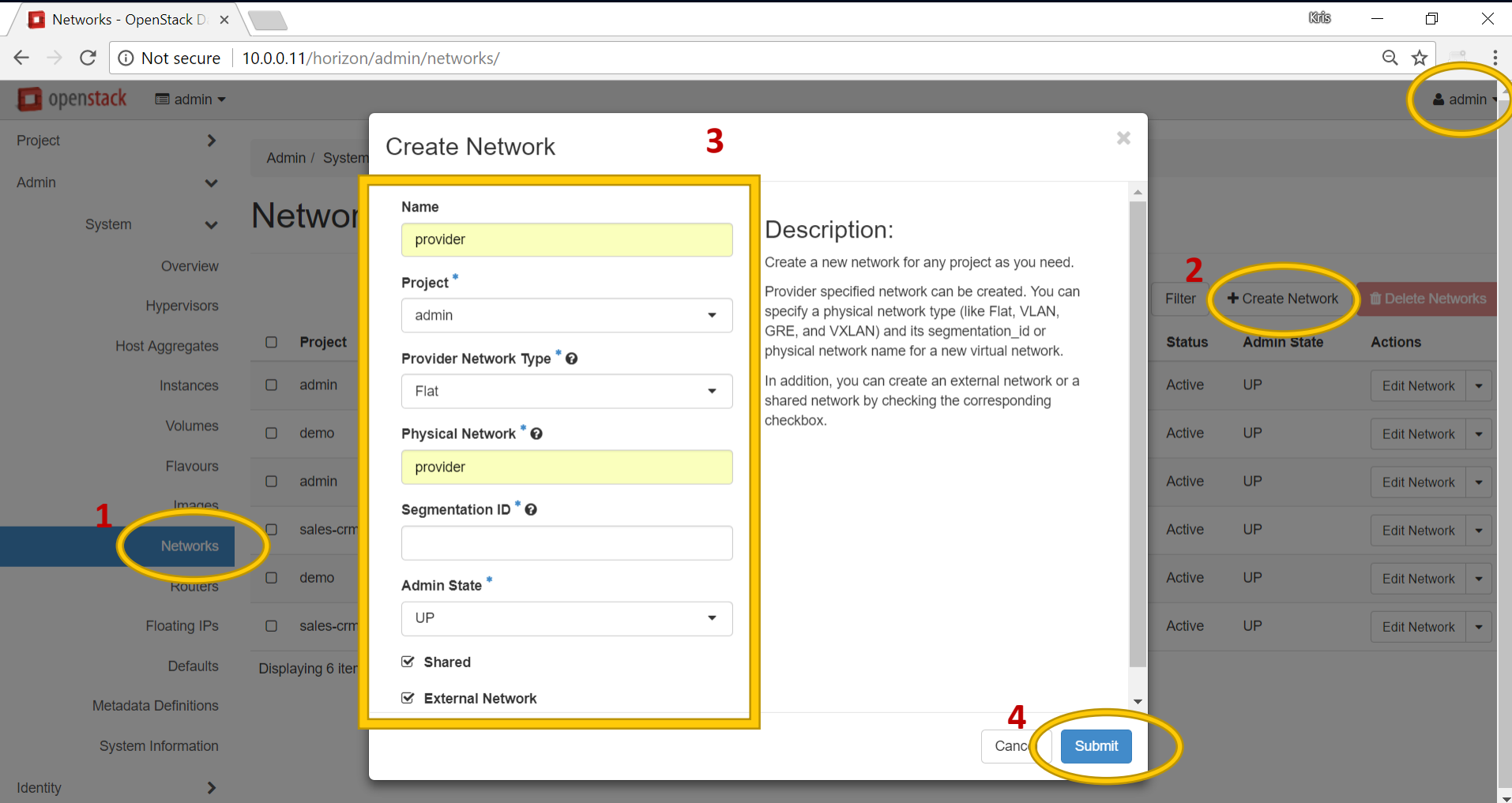
UP

UP

8

Cancel « Back Create

Create a Provider Network



The screenshot shows the OpenStack Horizon interface with the 'Create Network' dialog box open. The dialog is titled 'Create Network' and contains the following fields and options:

- Name:** provider
- Project:** admin
- Provider Network Type:** Flat
- Physical Network:** provider
- Segmentation ID:** (empty)
- Admin State:** UP
- Shared:** ☒
- External Network:** ☒

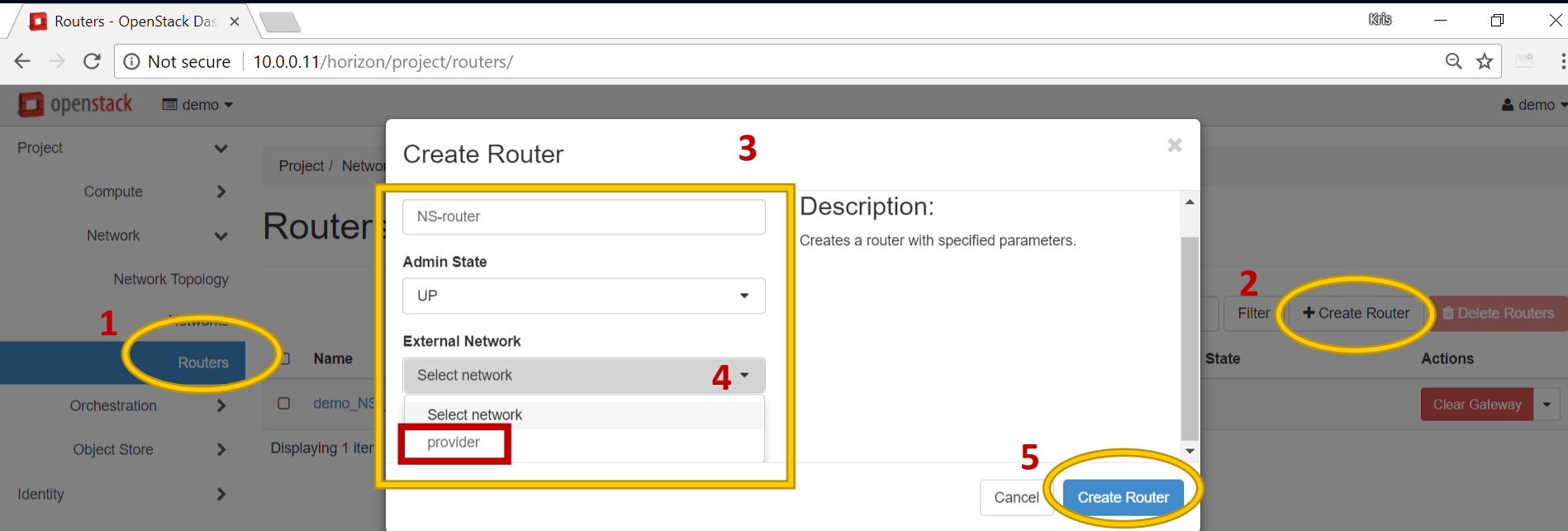
The dialog also includes a 'Description' section with the text: 'Create a new network for any project as you need. Provider specified network can be created. You can specify a physical network type (like Flat, VLAN, GRE, and VXLAN) and its segmentation_id or physical network name for a new virtual network. In addition, you can create an external network or a shared network by checking the corresponding checkbox.'

Numbered annotations (1-4) highlight the following elements:

1. The 'Networks' link in the left sidebar.
2. The '+ Create Network' button in the top right of the network list.
3. The 'Create Network' dialog box title.
4. The 'Submit' button at the bottom right of the dialog.

The background shows a list of networks with columns for Status, Admin State, and Actions. The 'admin' user is logged in, as indicated by the user profile icon in the top right corner.

Create a North-South Router



The screenshot shows the OpenStack Horizon interface for creating a router. The 'Routers' link in the left sidebar is circled in yellow and labeled with a red '1'. The 'Create Router' dialog box is open, with its title 'Create Router' labeled with a red '3'. Inside the dialog, the 'Name' field contains 'NS-router'. The 'Admin State' dropdown is set to 'UP'. The 'External Network' section has a dropdown menu labeled with a red '4' that is open, showing 'Select network' and 'provider', with 'provider' highlighted by a red box. The 'Create Router' button at the bottom right of the dialog is circled in yellow and labeled with a red '5'. In the background, the '+ Create Router' button in the router list is circled in yellow and labeled with a red '2'.

Routers - OpenStack Das x

10.0.0.11/horizon/project/routers/

openstack demo

Project / Network

Routers

1

3

Create Router

NS-router

Admin State

UP

External Network

Select network

4

Select network

provider

5

Cancel Create Router

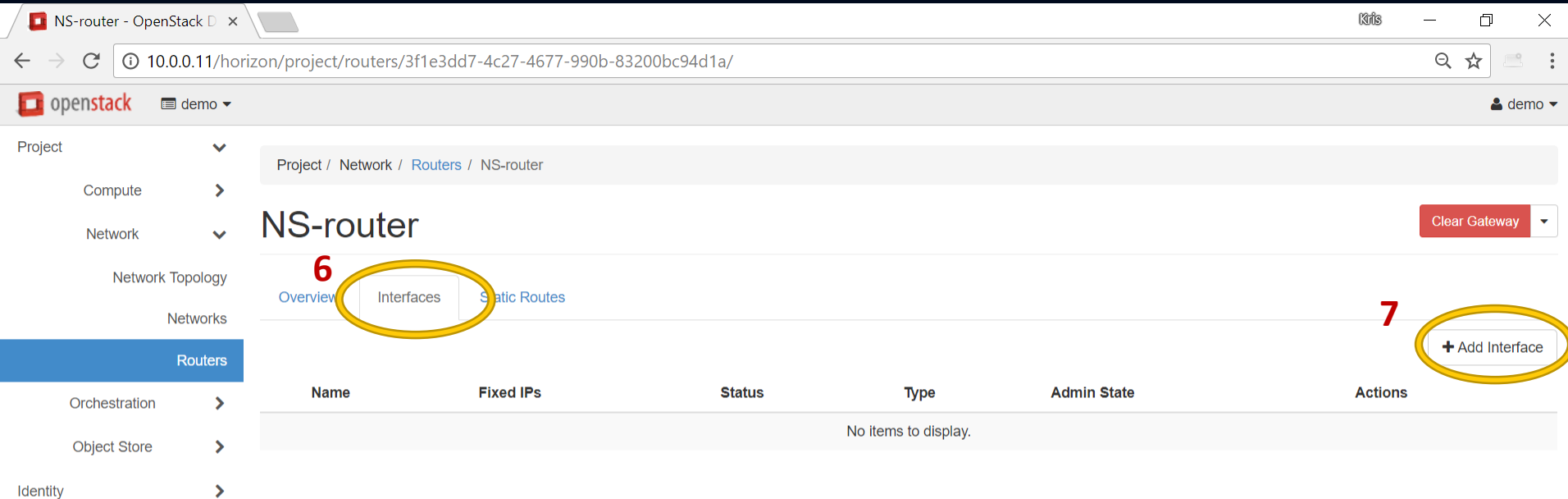
2

Filter + Create Router Delete Routers

State Actions

Clear Gateway

Create a North-South Router



NS-router - OpenStack

10.0.0.11/horizon/project/routers/3f1e3dd7-4c27-4677-990b-83200bc94d1a/

openstack demo

Project / Network / Routers / NS-router

NS-router

Clear Gateway

6

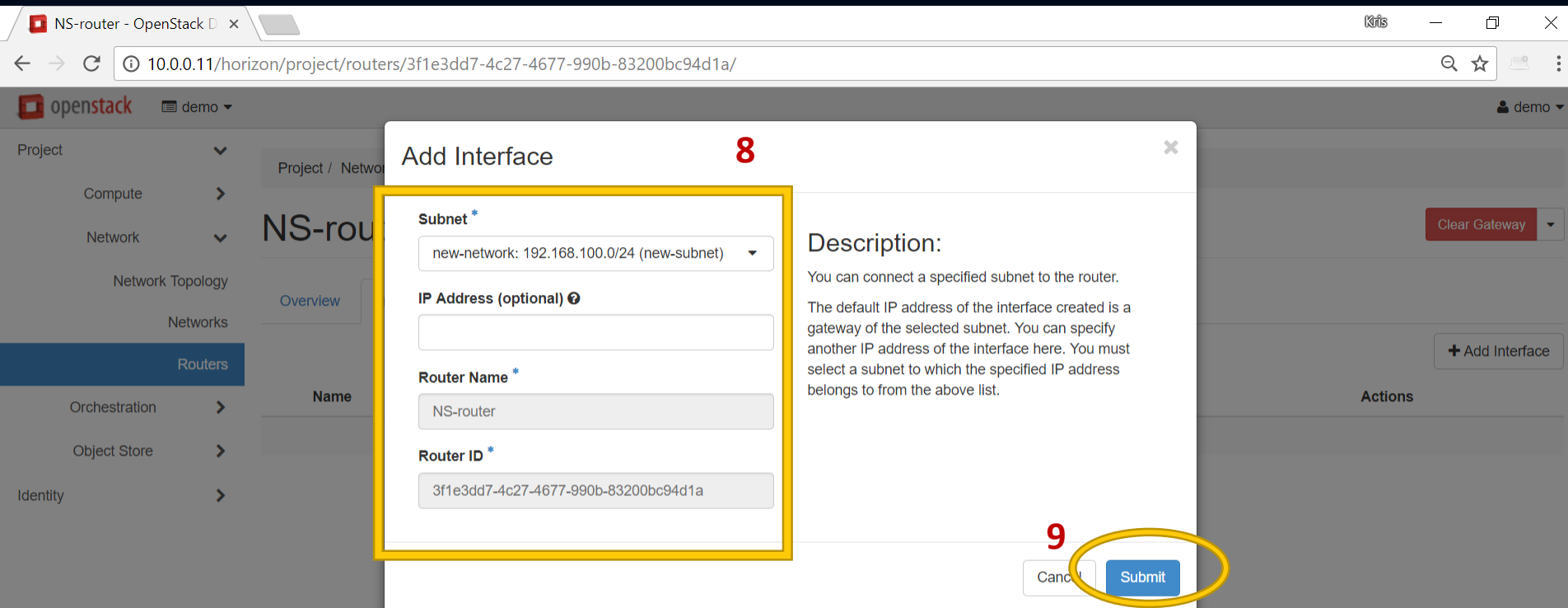
Overview Interfaces Static Routes

7

+ Add Interface

Name	Fixed IPs	Status	Type	Admin State	Actions
No items to display.					

Create a North-South Router



The screenshot shows the OpenStack Horizon web interface. A modal dialog titled "Add Interface" is open, with a red number "8" next to its title. The dialog contains the following fields:

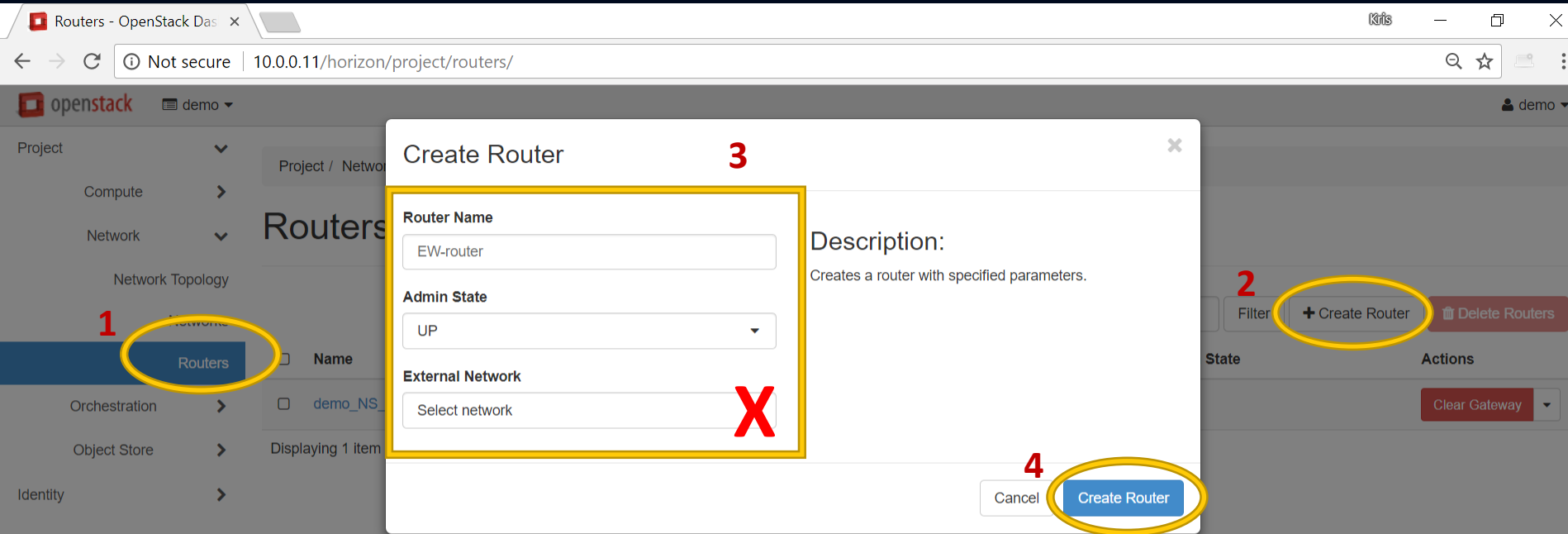
- Subnet ***: A dropdown menu showing "new-network: 192.168.100.0/24 (new-subnet)".
- IP Address (optional) ?**: An empty text input field.
- Router Name ***: A text input field containing "NS-router".
- Router ID ***: A text input field containing "3f1e3dd7-4c27-4677-990b-83200bc94d1a".

To the right of the form is a "Description:" section with the text: "You can connect a specified subnet to the router. The default IP address of the interface created is a gateway of the selected subnet. You can specify another IP address of the interface here. You must select a subnet to which the specified IP address belongs to from the above list."

At the bottom right of the dialog, there are "Cancel" and "Submit" buttons. A red number "9" is placed above the "Submit" button, which is also circled in yellow.

The background interface shows the "Routers" tab selected in the left sidebar. The router "NS-router" is visible in the main panel, with an "Add Interface" button in the "Actions" column.

Create East-West Router



The screenshot shows the OpenStack Horizon interface for managing Routers. A modal window titled "Create Router" is open, and several elements are highlighted with red annotations:

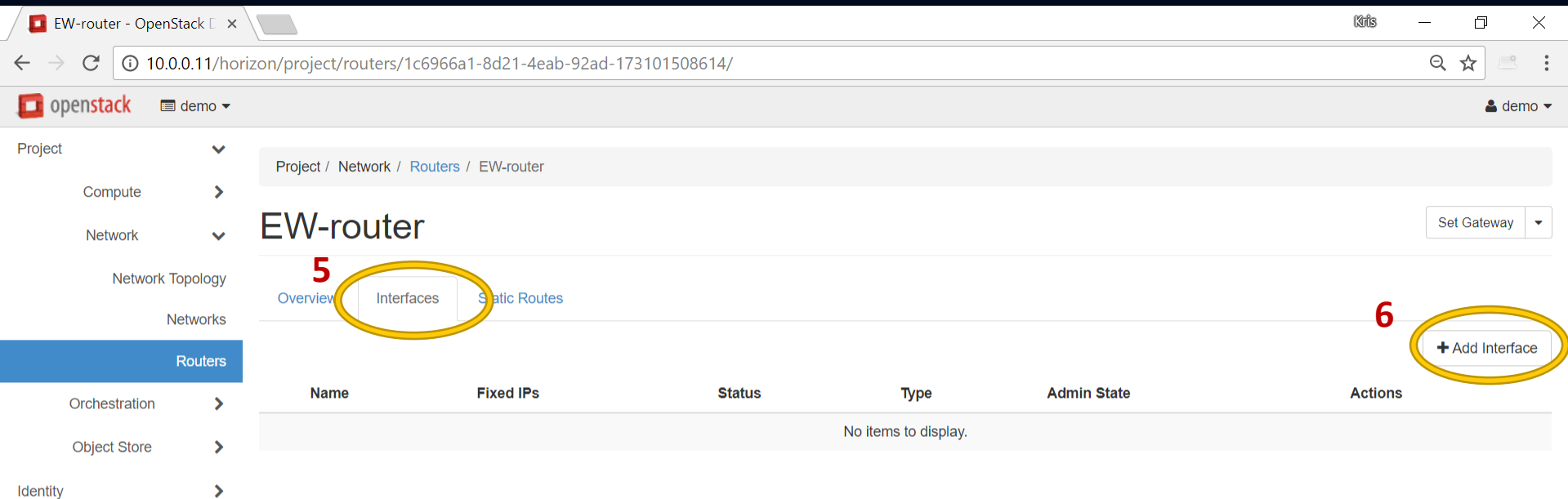
- 1**: The "Routers" link in the left-hand navigation menu is circled in yellow.
- 2**: The "+ Create Router" button in the top right of the Routers table is circled in yellow.
- 3**: The "Create Router" modal window is highlighted with a yellow border.
- 4**: The "Create Router" button at the bottom right of the modal is circled in yellow.
- X**: A large red "X" is placed over the "Select network" dropdown menu in the "External Network" section of the modal, indicating an error or required action.

The modal contains the following fields:

- Router Name**: Text input field containing "EW-router".
- Admin State**: Dropdown menu set to "UP".
- External Network**: Dropdown menu set to "Select network".
- Description**: Text area containing "Creates a router with specified parameters."

Buttons at the bottom of the modal are "Cancel" and "Create Router".

Create East-West Router



EW-router - OpenStack

10.0.0.11/horizon/project/routers/1c6966a1-8d21-4eab-92ad-173101508614/

openstack demo

Project / Network / Routers / EW-router

EW-router

Set Gateway

5

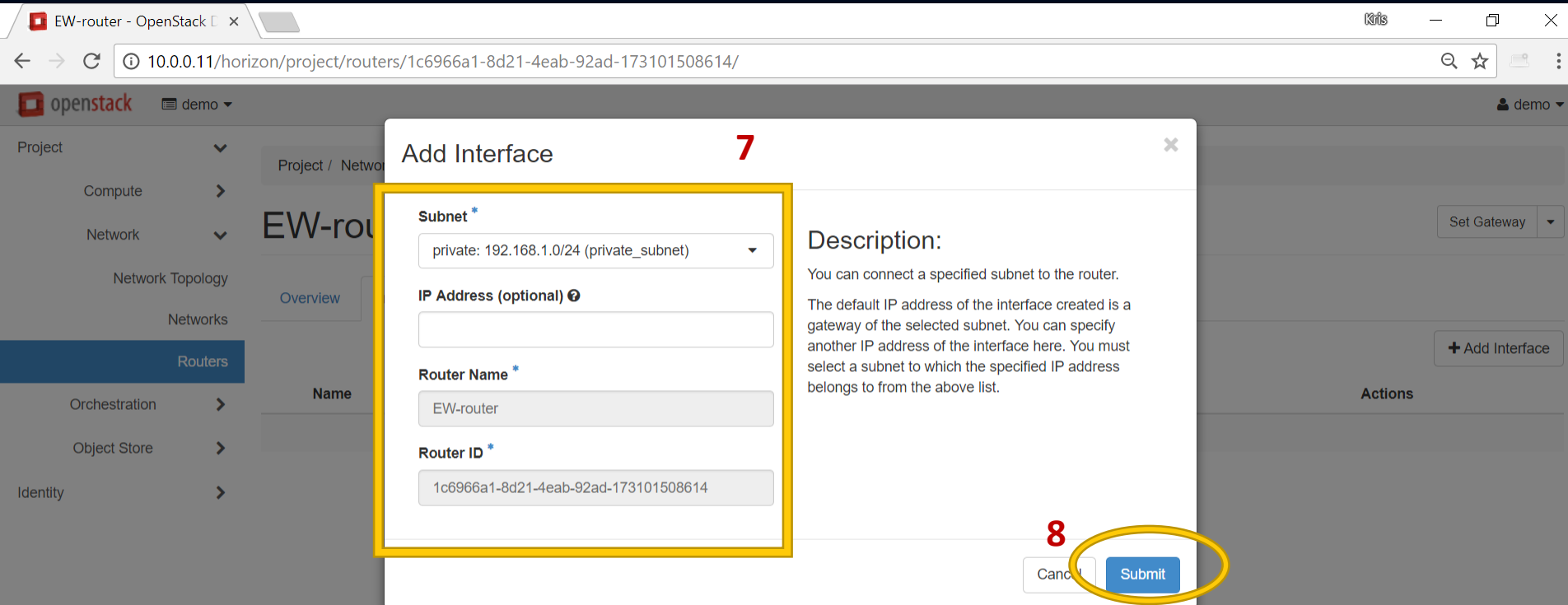
Overview Interfaces Static Routes

6

+ Add Interface

Name	Fixed IPs	Status	Type	Admin State	Actions
No items to display.					

Create East-West Router



EW-router - OpenStack

10.0.0.11/horizon/project/routers/1c6966a1-8d21-4eab-92ad-173101508614/

openstack demo

Project / Network

EW-router

Overview

Routers

Orchestration

Object Store

Identity

Name

Add Interface 7

Subnet *

private: 192.168.1.0/24 (private_subnet)

IP Address (optional) ?

Router Name *

EW-router

Router ID *

1c6966a1-8d21-4eab-92ad-173101508614

Description:

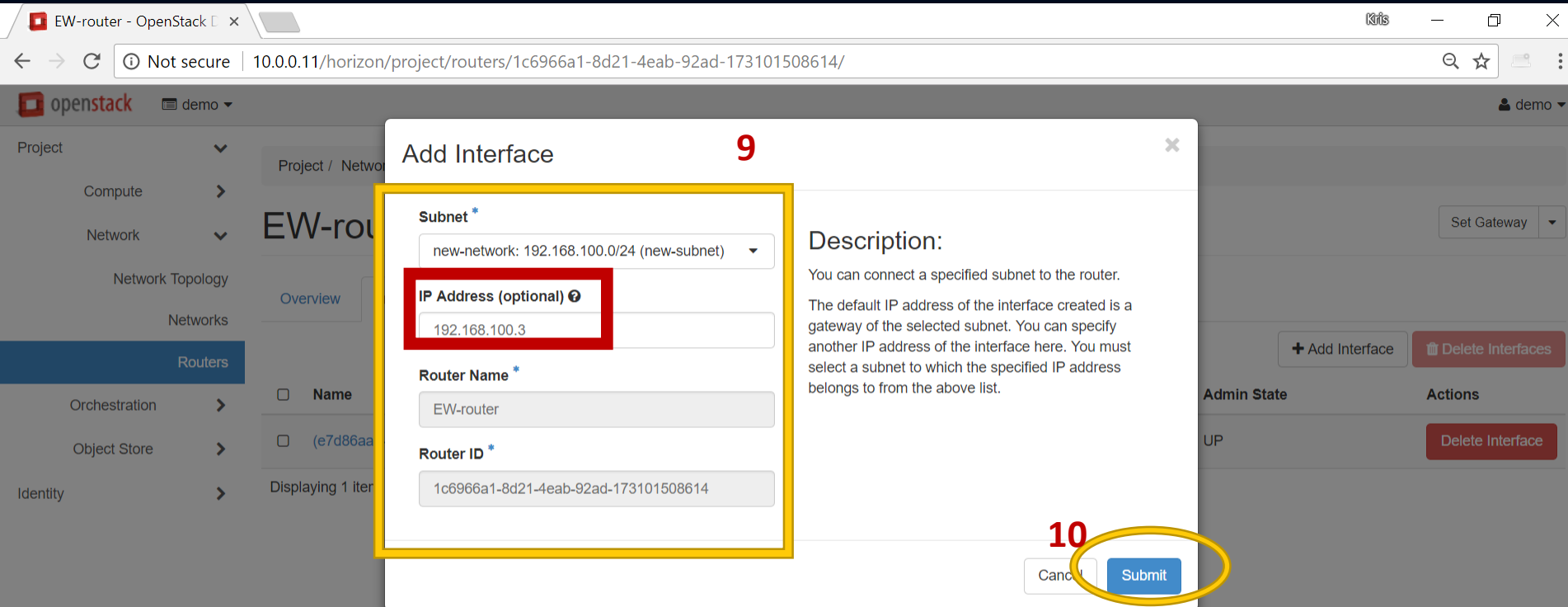
You can connect a specified subnet to the router.

The default IP address of the interface created is a gateway of the selected subnet. You can specify another IP address of the interface here. You must select a subnet to which the specified IP address belongs to from the above list.

8

Cancel Submit

Create East-West Router



EW-router - OpenStack

Not secure | 10.0.0.11/horizon/project/routers/1c6966a1-8d21-4eab-92ad-173101508614/

openstack demo

Project / Network

EW-router

Overview

Routers

Orchestration

Object Store

Identity

Subnet *

new-network: 192.168.100.0/24 (new-subnet)

IP Address (optional) ⓘ

192.168.100.3

Router Name *

EW-router

Router ID *

1c6966a1-8d21-4eab-92ad-173101508614

Description:

You can connect a specified subnet to the router.

The default IP address of the interface created is a gateway of the selected subnet. You can specify another IP address of the interface here. You must select a subnet to which the specified IP address belongs to from the above list.

+ Add Interface

Delete Interfaces

Admin State

UP

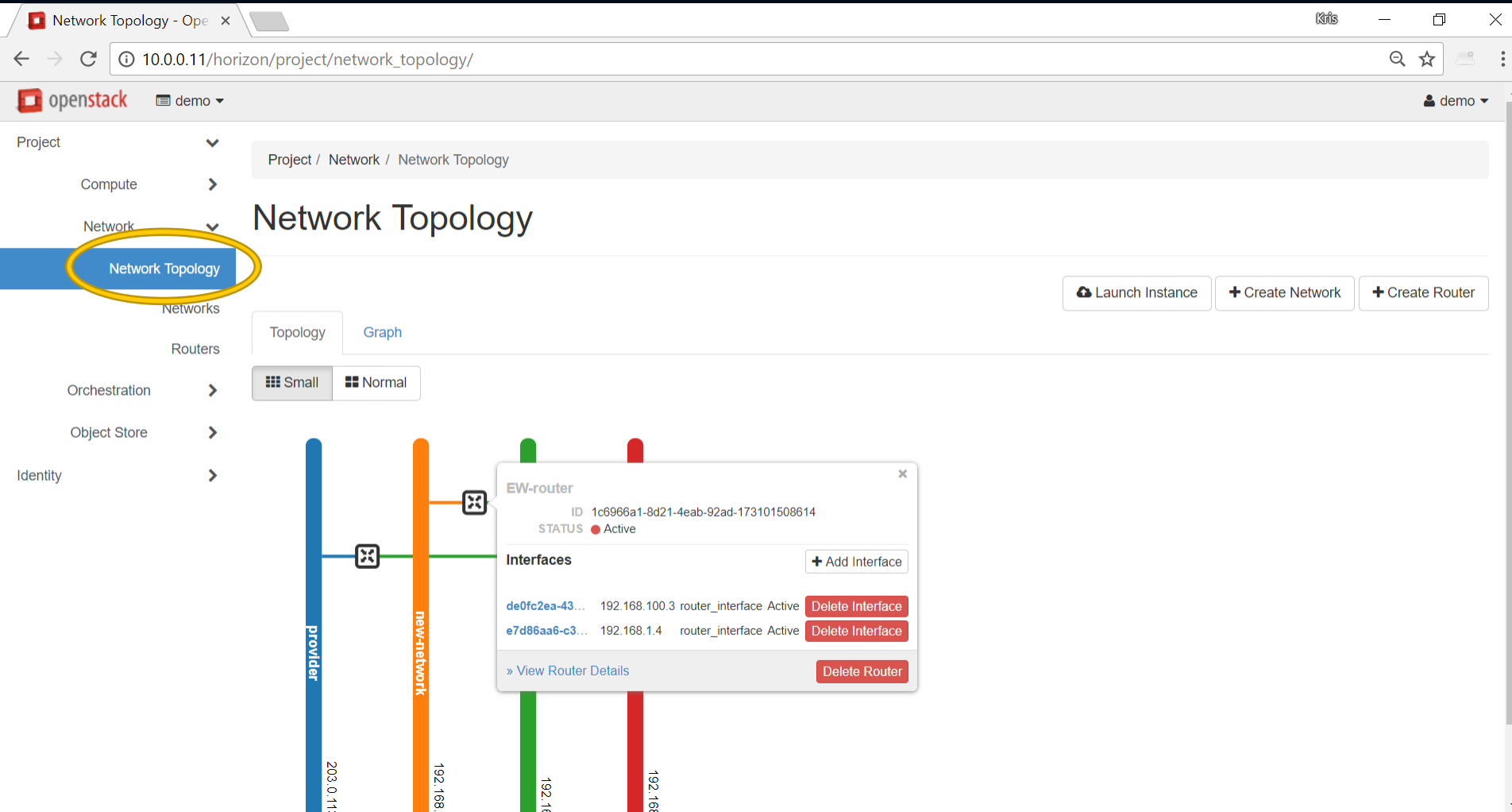
Actions

Delete Interface

Cancel

Submit

Review Project Network Topology



Network Topology - Ope x

10.0.0.11/horizon/project/network_topology/

openstack demo

Project / Network / Network Topology

Network Topology

Launch Instance + Create Network + Create Router

Topology Graph

Small Normal

EW-router

ID 1c6966a1-8d21-4eab-92ad-173101508614

STATUS ● Active

Interfaces + Add Interface

de0fc2ea-43...	192.168.100.3	router_interface	Active	Delete Interface
e7d86aa6-c3...	192.168.1.4	router_interface	Active	Delete Interface

» View Router Details Delete Router

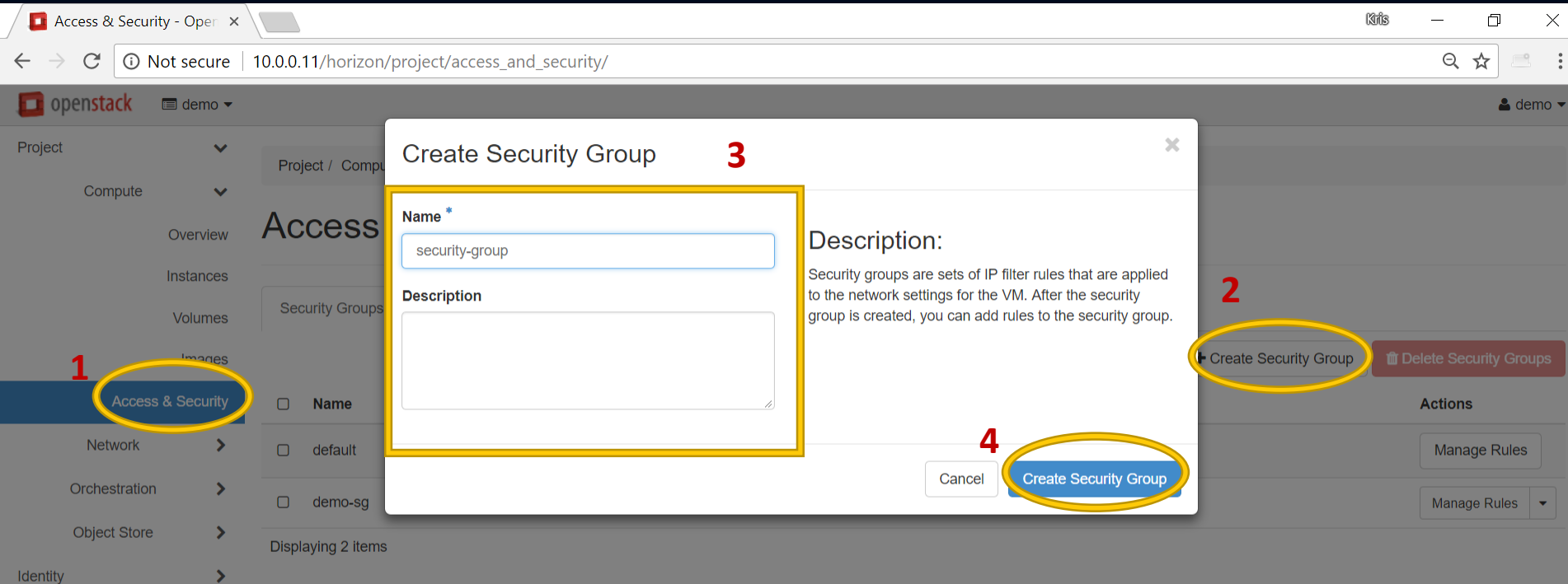
provider 203.0.113

new-network 192.168

192.168

192.168

Create Security Group



The screenshot shows the OpenStack Horizon interface with the 'Create Security Group' dialog box open. The dialog box has a title bar with a close button. The main content area is divided into two sections: 'Name' and 'Description'. The 'Name' section has a text input field containing 'security-group'. The 'Description' section has a text area. The background interface shows the 'Access & Security' menu on the left, the 'Security Groups' table in the center, and the 'Create Security Group' button on the right. The dialog box is titled 'Create Security Group' and has a close button in the top right corner. The 'Name' field is labeled 'Name' and has a required field asterisk. The 'Description' field is labeled 'Description'. The background interface shows the 'Access & Security' menu on the left, the 'Security Groups' table in the center, and the 'Create Security Group' button on the right. The dialog box is titled 'Create Security Group' and has a close button in the top right corner. The 'Name' field is labeled 'Name' and has a required field asterisk. The 'Description' field is labeled 'Description'.

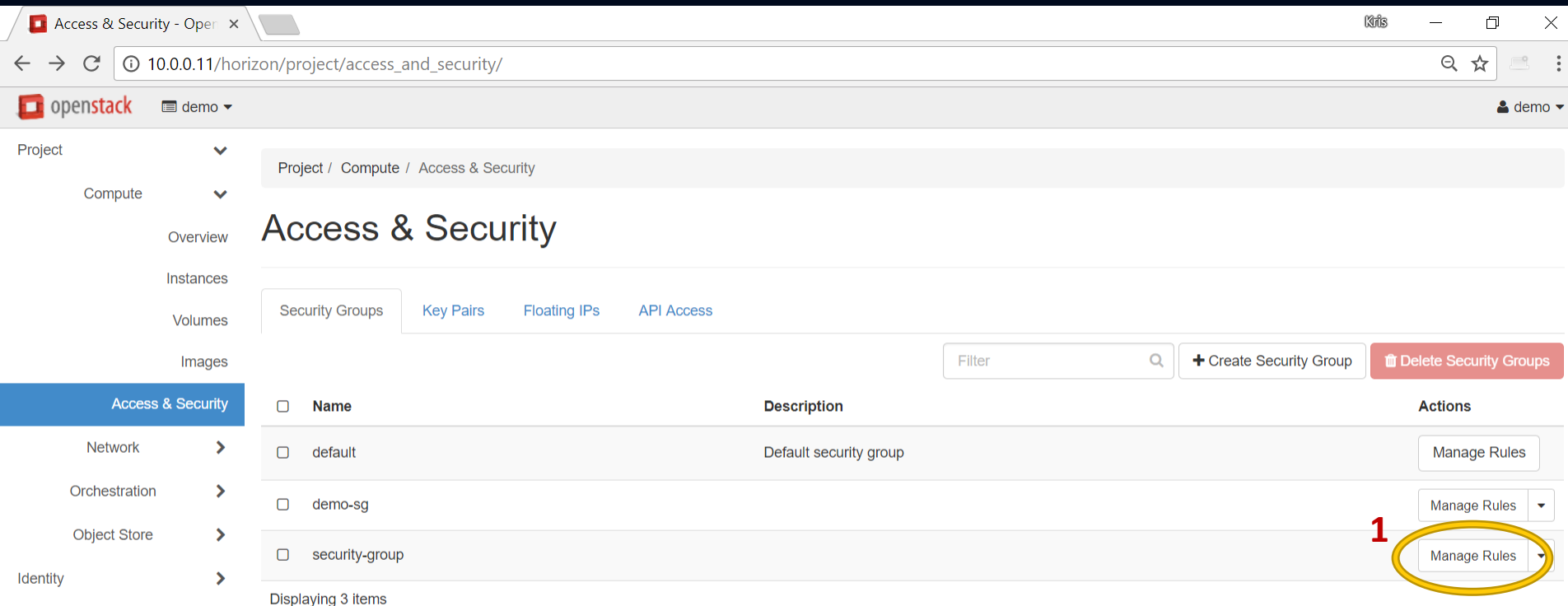
1 Access & Security

2 Create Security Group

3 Create Security Group

4 Create Security Group

Manage Security Group Rules



Access & Security - Open x

10.0.0.11/horizon/project/access_and_security/

openstack demo

Project / Compute / Access & Security

Access & Security

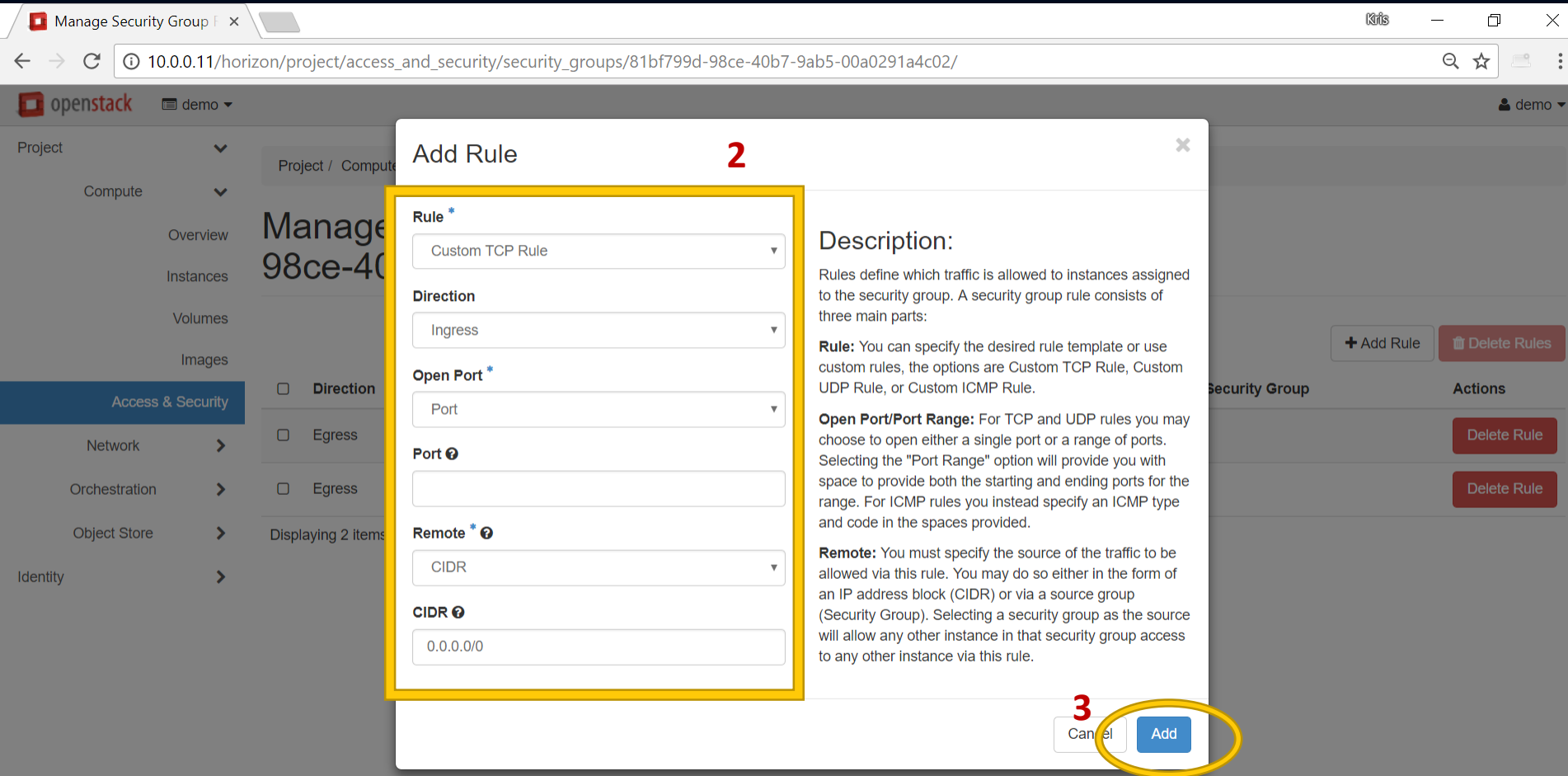
Security Groups Key Pairs Floating IPs API Access

Filter + Create Security Group Delete Security Groups

<input type="checkbox"/>	Name	Description	Actions
<input type="checkbox"/>	default	Default security group	Manage Rules
<input type="checkbox"/>	demo-sg		Manage Rules
<input type="checkbox"/>	security-group		Manage Rules

Displaying 3 items

Manage Security Group Rules



Manage Security Group

10.0.0.11/horizon/project/access_and_security/security_groups/81bf799d-98ce-40b7-9ab5-00a0291a4c02/

openstack demo

Project / Compute

Manage 98ce-40

Overview

Instances

Volumes

Images

Access & Security

Network

Orchestration

Object Store

Identity

Direction

Egress

Egress

Displaying 2 items

Add Rule 2

Rule *

Custom TCP Rule

Direction

Ingress

Open Port *

Port

Port ?

Remote * ?

CIDR

CIDR ?

0.0.0.0/0

Description:

Rules define which traffic is allowed to instances assigned to the security group. A security group rule consists of three main parts:

Rule: You can specify the desired rule template or use custom rules, the options are Custom TCP Rule, Custom UDP Rule, or Custom ICMP Rule.

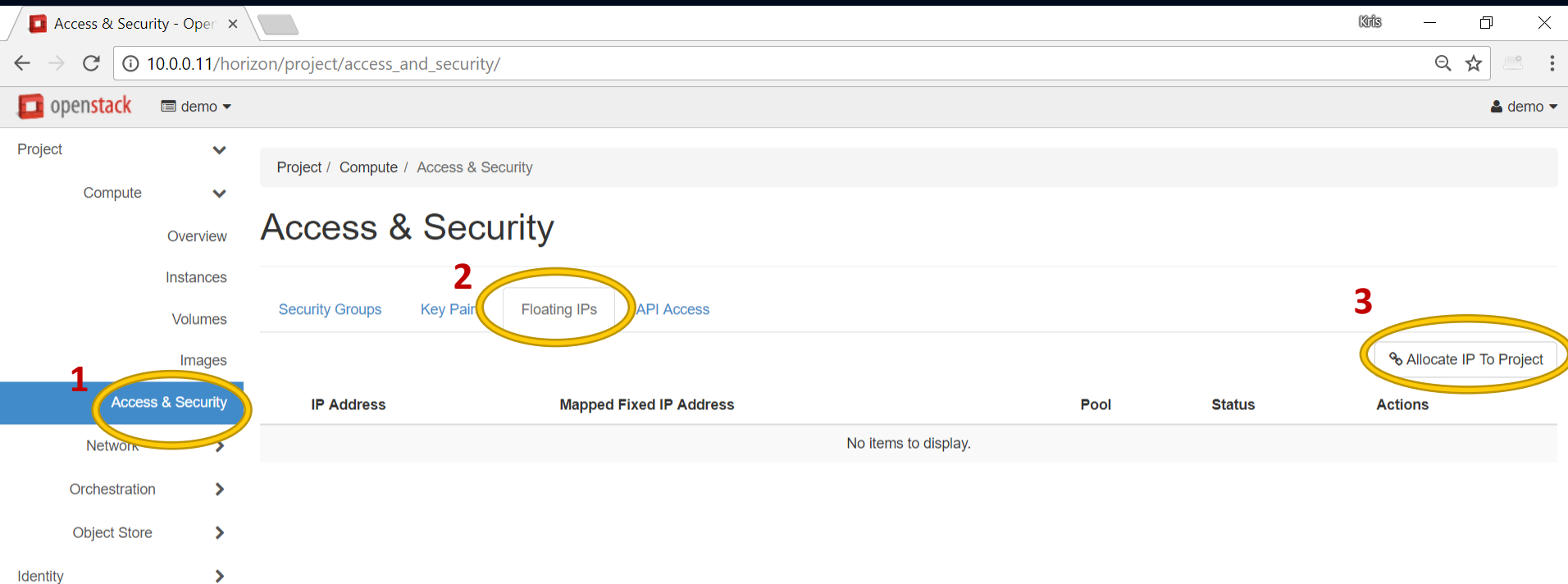
Open Port/Port Range: For TCP and UDP rules you may choose to open either a single port or a range of ports. Selecting the "Port Range" option will provide you with space to provide both the starting and ending ports for the range. For ICMP rules you instead specify an ICMP type and code in the spaces provided.

Remote: You must specify the source of the traffic to be allowed via this rule. You may do so either in the form of an IP address block (CIDR) or via a source group (Security Group). Selecting a security group as the source will allow any other instance in that security group access to any other instance via this rule.

3

Cancel Add

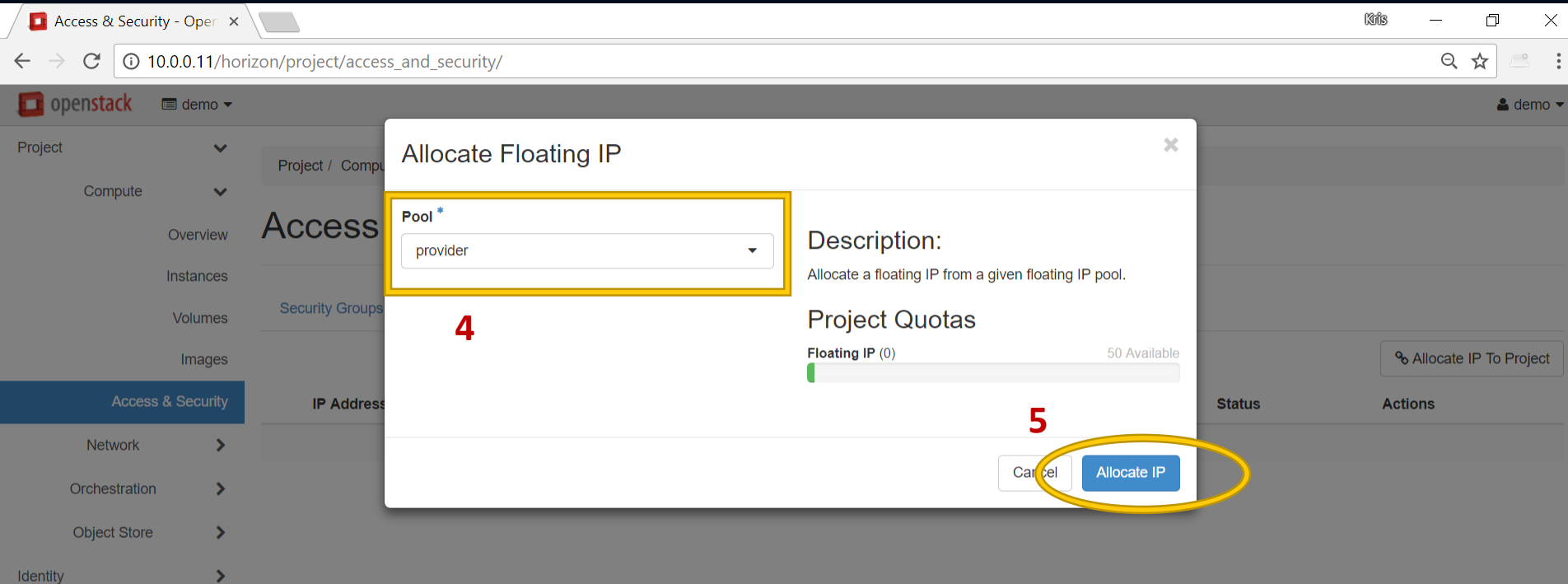
Allocate Floating IP to a Project



The screenshot shows the OpenStack Horizon web interface. The browser address bar displays `10.0.0.11/horizon/project/access_and_security/`. The OpenStack logo and 'demo' user are visible in the top navigation bar. The left sidebar contains a menu with 'Access & Security' highlighted, marked with a red '1' and a yellow circle. The main content area shows the 'Access & Security' page with a breadcrumb 'Project / Compute / Access & Security'. Below the title, there are tabs for 'Security Groups', 'Key Pairs', 'Floating IPs' (marked with a red '2' and a yellow circle), and 'API Access'. The 'Floating IPs' tab is active, showing a table with columns: 'IP Address', 'Mapped Fixed IP Address', 'Pool', 'Status', and 'Actions'. The table is currently empty, displaying 'No items to display.' The 'Actions' column contains a button labeled 'Allocate IP To Project' (marked with a red '3' and a yellow circle).

IP Address	Mapped Fixed IP Address	Pool	Status	Actions
No items to display.				

Allocate Floating IP to a Project



The screenshot shows the OpenStack Horizon web interface. A modal dialog titled "Allocate Floating IP" is open. The dialog has a "Pool" dropdown menu with "provider" selected, highlighted by a red number 4. To the right, the "Description:" section states "Allocate a floating IP from a given floating IP pool." Below this, the "Project Quotas" section shows "Floating IP (0)" and "50 Available" with a progress bar. At the bottom right of the dialog, there are "Cancel" and "Allocate IP" buttons, with the "Allocate IP" button highlighted by a red number 5 and a red circle. The background interface shows the "Access & Security" tab selected in the left sidebar, and the "Allocate IP To Project" button in the top right corner.

Access & Security - Open x

10.0.0.11/horizon/project/access_and_security/

openstack demo

Project / Compute

Access

Overview

Instances

Volumes

Images

Access & Security

Network

Orchestration

Object Store

Identity

IP Address

Status

Actions

Allocate IP To Project

Allocate Floating IP

Pool *

provider

Description:

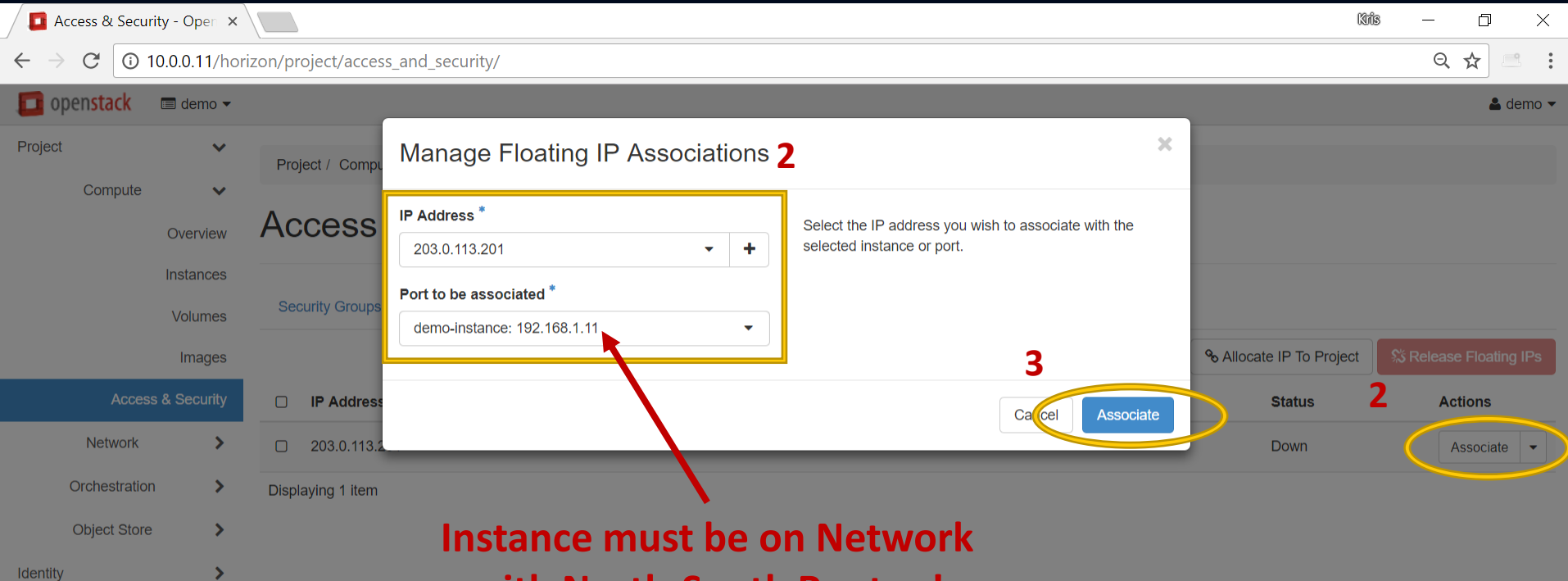
Allocate a floating IP from a given floating IP pool.

Project Quotas

Floating IP (0) 50 Available

Cancel Allocate IP

Associate Floating IP to an Instance



Access & Security - Open x

10.0.0.11/horizon/project/access_and_security/

openstack demo

Project / Compute

Access

Overview

Instances

Volumes

Images

Access & Security

Network

Orchestration

Object Store

Identity

Manage Floating IP Associations 2

IP Address *

203.0.113.201 +

Port to be associated *

demo-instance: 192.168.1.11

Select the IP address you wish to associate with the selected instance or port.

Cancel Associate 3

Allocate IP To Project 1 Release Floating IPs

Status 2

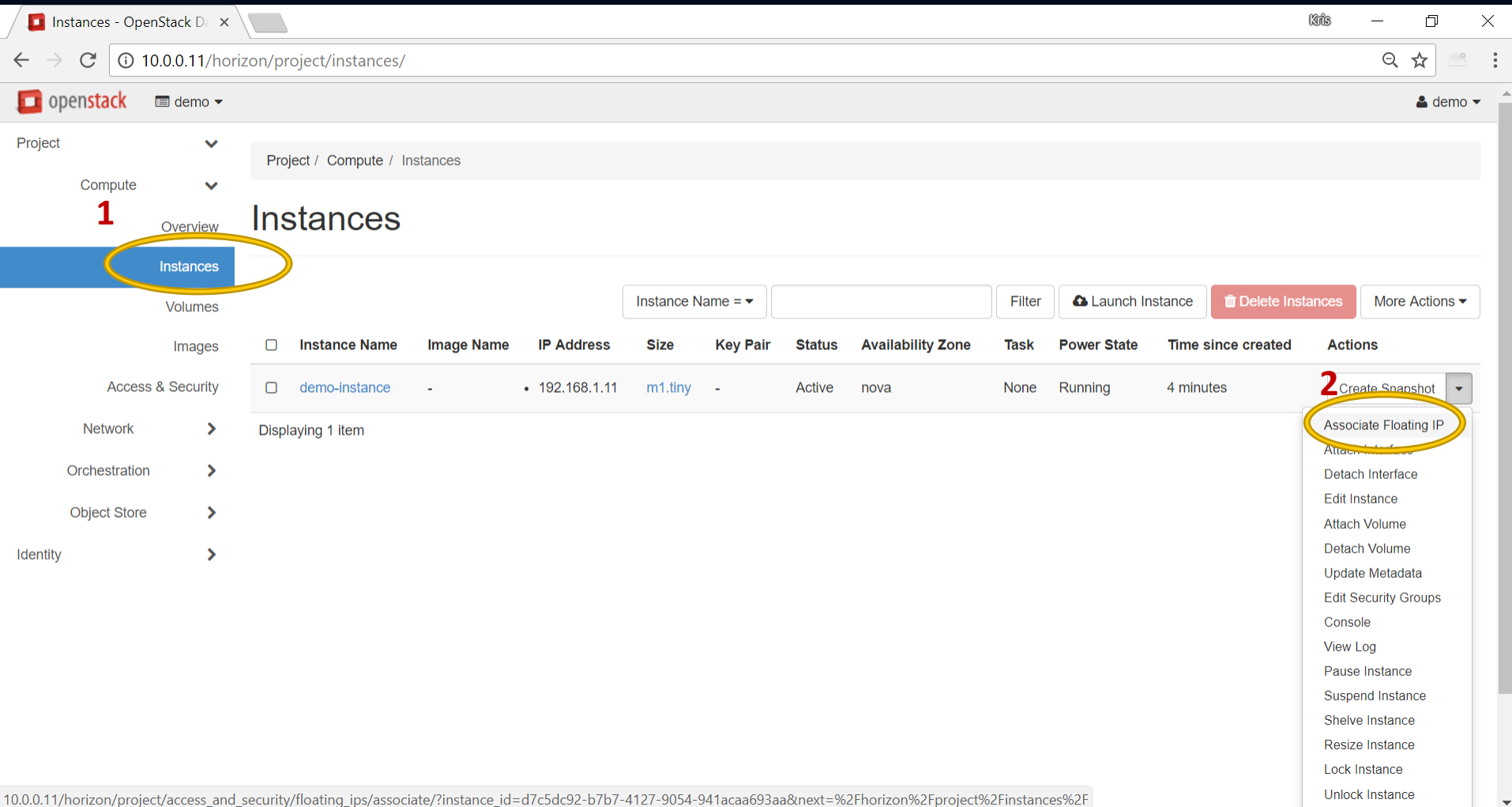
Down

Actions

Associate

Instance must be on Network with North-South Router !

Associate Floating IP to an Instance



Instances - OpenStack Dashboard

10.0.0.11/horizon/project/instances/

openstack demo

Project / Compute / Instances

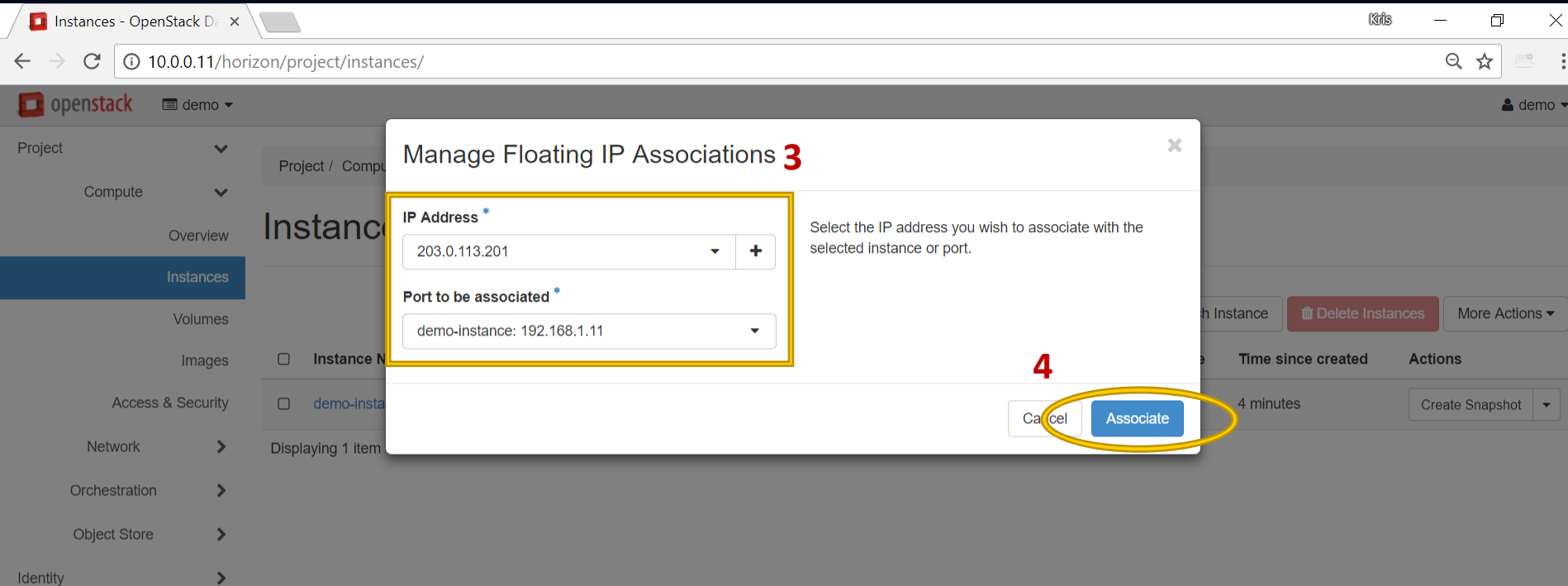
1 Overview Instances

Instance Name = Filter Launch Instance Delete Instances More Actions

Instance Name	Image Name	IP Address	Size	Key Pair	Status	Availability Zone	Task	Power State	Time since created	Actions
<input type="checkbox"/> demo-instance	-	• 192.168.1.11	m1.tiny	-	Active	nova	None	Running	4 minutes	2 Create Snapshot Associate Floating IP Attach Floating IP Detach Interface Edit Instance Attach Volume Detach Volume Update Metadata Edit Security Groups Console View Log Pause Instance Suspend Instance Shelf Instance Resize Instance Lock Instance Unlock Instance

10.0.0.11/horizon/project/access_and_security/floating_ips/associate/?instance_id=d7c5dc92-b7b7-4127-9054-941acaa693aa&next=%2Fhorizon%2Fproject%2Finstances%2F

Associate Floating IP to an Instance



The screenshot shows the OpenStack Horizon web interface. A modal dialog titled "Manage Floating IP Associations" is open. The dialog has two main sections: "IP Address" and "Port to be associated". The "IP Address" section has a dropdown menu showing "203.0.113.201" and a "+" button. The "Port to be associated" section has a dropdown menu showing "demo-instance: 192.168.1.11". To the right of these sections is a text instruction: "Select the IP address you wish to associate with the selected instance or port." At the bottom right of the dialog, there are two buttons: "Cancel" and "Associate". The "Associate" button is highlighted with a yellow circle and a red number "4". The background interface shows a sidebar with navigation links like "Project", "Compute", "Overview", "Instances", "Volumes", "Images", "Access & Security", "Network", "Orchestration", "Object Store", and "Identity". The main content area shows a table of instances with columns for "Instance Name", "Time since created", and "Actions".

Instances - OpenStack Dashboard

10.0.0.11/horizon/project/instances/

openstack demo

Project / Compute

Instance Name

demo-instance

Displaying 1 item

Manage Floating IP Associations 3

IP Address *

203.0.113.201 +

Port to be associated *

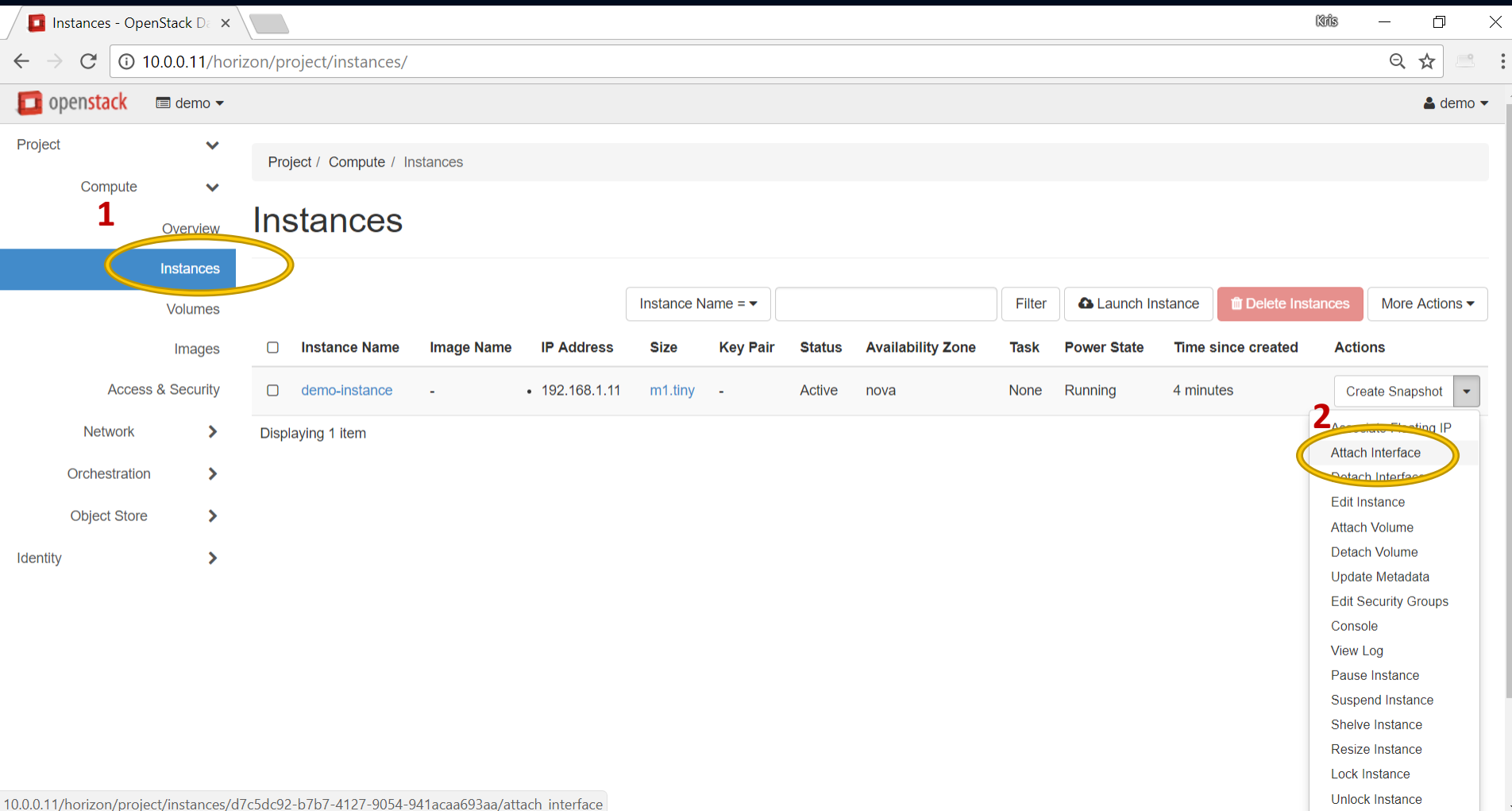
demo-instance: 192.168.1.11

Select the IP address you wish to associate with the selected instance or port.

4

Cancel Associate

Attach Network Interface to an Instance



Instances - OpenStack Dashboard

10.0.0.11/horizon/project/instances/

openstack demo

Project / Compute / Instances

1 Overview Instances

Volumes

Instance Name = Filter Launch Instance Delete Instances More Actions

Instance Name	Image Name	IP Address	Size	Key Pair	Status	Availability Zone	Task	Power State	Time since created	Actions
<input type="checkbox"/> demo-instance	-	• 192.168.1.11	m1.tiny	-	Active	nova	None	Running	4 minutes	<div>2</div> <div>Create Snapshot Associate Floating IP Attach Interface Detach Interface Edit Instance Attach Volume Detach Volume Update Metadata Edit Security Groups Console View Log Pause Instance Suspend Instance Shelve Instance Resize Instance Lock Instance Unlock Instance</div>

Access & Security

Network > Displaying 1 item

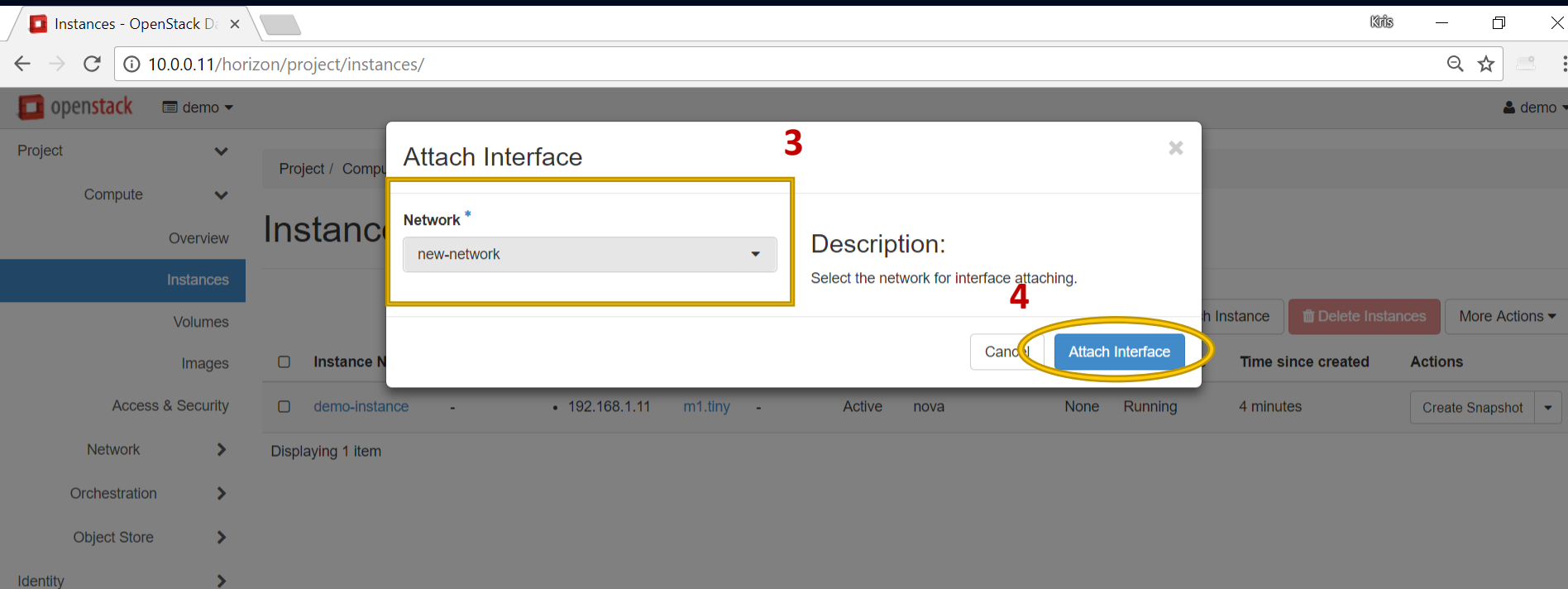
Orchestration >

Object Store >

Identity >

10.0.0.11/horizon/project/instances/d7c5dc92-b7b7-4127-9054-941acaa693aa/attach_interface

Attach Network Interface to an Instance



Instances - OpenStack Dashboard

10.0.0.11/horizon/project/instances/

openstack demo

Project / Compute

Instance

Network

Attach Interface

Network *

new-network

Description:

Select the network for interface attaching.

Cancel Attach Interface

Instance	IP	Flavor	Status	OS	Network	Time since created	Actions	
demo-instance	192.168.1.11	m1.tiny	Active	nova	None	Running	4 minutes	Create Snapshot

Modify Routing Tables of a Router

Network Topology - Ope x

10.0.0.11/horizon/project/network_topology/

openstack demo

Project / Network / Network Topology

Network Topology

Launch Instance Create Network Create Router

Topology Graph

Small Normal

demo_NS_router

ID 442c7c26-84d9-458b-ba36-da78b40d1a00

STATUS Active

Interfaces

+ Add Interface

b57f5167-b8... 192.168.1.1 router_interface Active Delete Interface

2efawav5687 None None

» View Router Details Delete Router

provider

203.1

192.168.1.1

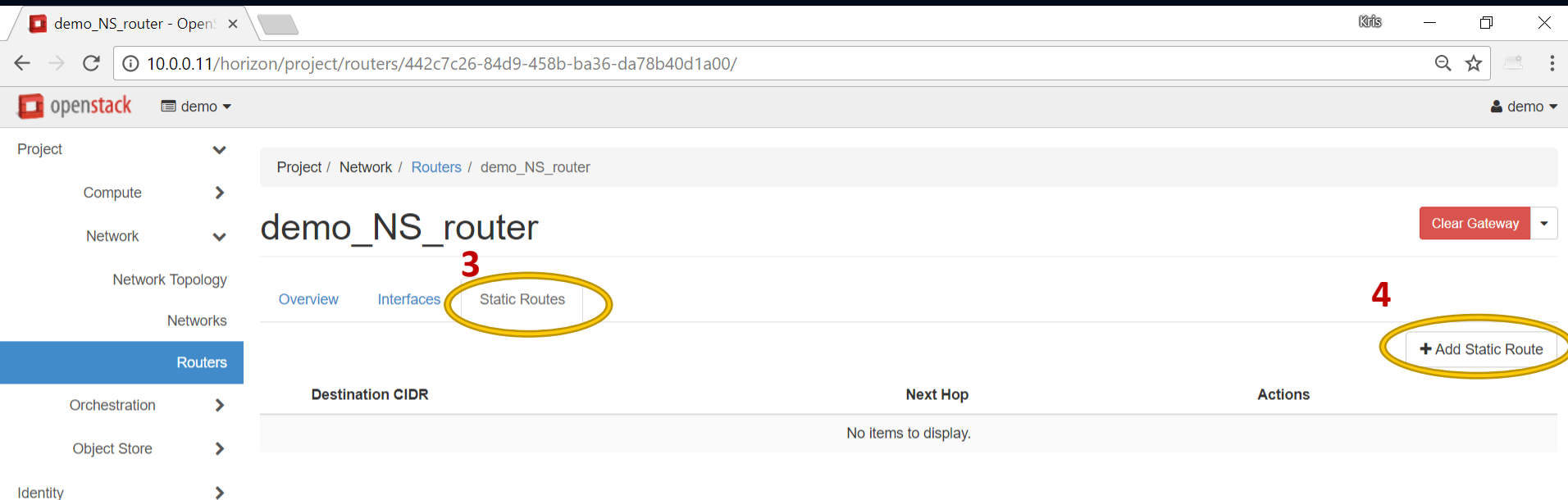
192.168.1.2

192.168.1.3

192.168.1.4

10.0.0.11/horizon/project/routers/442c7c26-84d9-458b-ba36-da78b40d1a00/

Modify Routing Tables of a Router



demo_NS_router - OpenStack

10.0.0.11/horizon/project/routers/442c7c26-84d9-458b-ba36-da78b40d1a00/

openstack demo

Project / Network / Routers / demo_NS_router

demo_NS_router

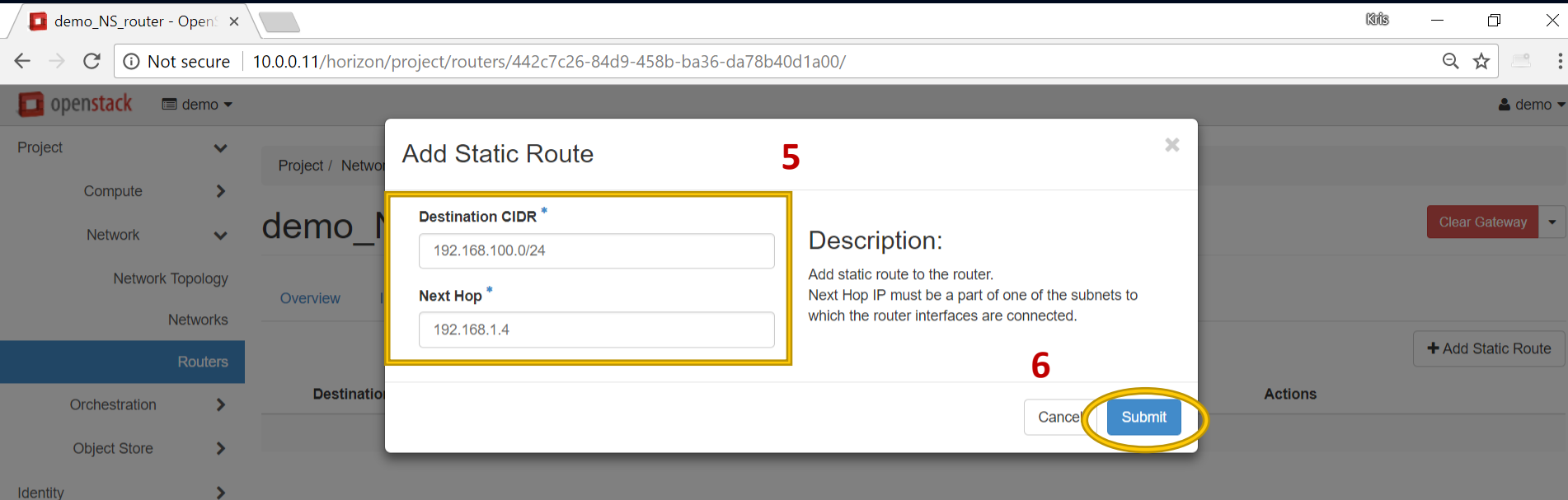
Clear Gateway

Overview Interfaces Static Routes

+ Add Static Route

Destination CIDR	Next Hop	Actions
No items to display.		

Modify Routing Tables of a Router



demo_NS_router - OpenStack

10.0.0.11/horizon/project/routers/442c7c26-84d9-458b-ba36-da78b40d1a00/

openstack demo

Project / Network

demo_M

Overview

Destination

Actions

Clear Gateway

+ Add Static Route

Cancel Submit

Add Static Route 5

Destination CIDR *

192.168.100.0/24

Next Hop *

192.168.1.4

Description:

Add static route to the router.
Next Hop IP must be a part of one of the subnets to which the router interfaces are connected.

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CLI Review

```
$ neutron net-create <project-network-name>
```

```
$ grep "physical_interface_mappings" \  
/etc/neutron/plugins/ml2/linuxbridge_agent.ini  
physical_interface_mappings = provider:eth1
```

```
$ neutron net-create --shared --router:external=true \  
--provider:network-type=<flat> \  
--provider:physical-network=<provider> \  
<provider-network-name>
```

```
$ openstack subnet create --network <network> \  
--subnet-range <CIDR> --dns-nameserver <dns-nameserver> \  
--allocation pool start=<addr>,end=<addr>  
<subnet-name>
```

CLI Review

```
$ neutron net-list
```

```
$ neutron net-list --tenant-id <project>
```

```
$ neutron net-list --router:external True
```

```
$ neutron net-show <network>
```

```
$ neutron subnet-list
```

```
$ neutron subnet-show <subnet>
```

```
$ neutron net-ip-availability-list
```

```
$ neutron net-ip-availability-show <network>
```

CLI Review

```
$ neutron router-create <router-name>
```

```
$ neutron router-gateway-set <router> <external-network>
```

```
$ neutron router-interface-add <router> <subnet>
```

```
$ neutron port-create --name <port-name> <network>
```

```
$ neutron router-interface-add <router> port=<port-name>
```

```
$ neutron router-list
```

```
$ neutron router-show <router>
```

```
$ neutron router-port-list <router>
```

CLI Review

```
$ neutron security-group-create <security-group-name>
```

```
$ neutron security-group-list
```

```
$ neutron security-group-show <security-group>
```

```
$ neutron security-group-rule-create --protocol <icmp|tcp|..> \  
--direction <ingress|egress> \  
--port-range-min <port-num> --port-range-max <port-num> \  
--remote-ip-prefix <CIDR> | --remote-group-id <sec-group> \  
<security-group>
```

```
$ neutron security-group-rule-list
```

```
$ neutron security-group-show <sec-group-rule-id>
```

```
$ neutron security-group-rule-delete
```

CLI Review

```
$ neutron floatingip-create
```

```
$ neutron floatingip-create --tenant <project>
```

```
$ neutron floatingip-list
```

```
$ neutron floatingip-show <floating-ip>
```

```
$ openstack server add floating ip <instance> <floating-ip>
```

```
$ openstack server remove floating ip <instance> <floating-ip>
```

```
$ neutron floatingip-delete <floating-ip>
```

CLI Review

```
$ openstack router list
$ openstack server show <instance>
$ sudo su
# ip netns | grep <router-UUID>
# ip netns exec qrouter-<router-UUID> bash
$ ping -c 3 <floating-ip>
$ ssh <user>@<floating-ip>
```


CLI Review

```
$ openstack network list
$ nova interface-attach --net-id <network-UUID> <instance>
$ openstack server add security group <instance> <sec-group>
$ openstack server show <instance>
```

```
<controller> $ sudo su
<controller> # ip netns exec qdhcp-<network-UUID> \
                ssh <user>@<ip-addr-in-eth0-net>
```

```
<instance> $ sudo su
<instance> # vi /etc/network/interfaces
```

...

```
auto eth1
iface eth1 inet dhcp
```

CLI Review

```
<instance> # ifup eth1
```

```
<instance> # ip route
```

```
<instance> # ip route del default via <second-net-gw-ipaddr>
```

```
$ neutron quota-default-show
```

```
$ neutron quota-show --tenant-id <project>
```

```
$ neutron quota-update --tenant-id <project> \  
  --network <networks> --subnet <subnets> --router <routers> \  
  --floatingip <floatingips> --security-group <sec-groups> \  
  --security-group-rule <sec-group-rules>
```

Preparing to **Certified OpenStack Administrator** Exam

Section 8 – OpenStack Network Service

Lecture 35. Neutron Summary and Review

Thank you!