



**Experiment No. 03**

**Title: OpenStack Networking**

**Batch: B–1 Roll No.: 16010422234 Experiment No.: 03**

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**Aim:** Create a private network for OpenStack (IaaS)

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**Resources needed:** OpenStack

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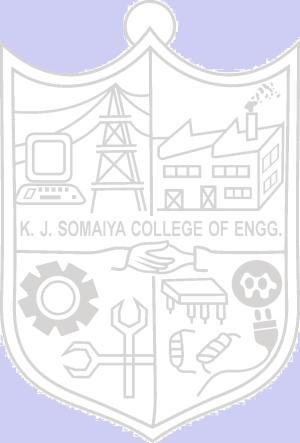
**Prerequisite:** Knowledge of Client Server communication

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**Theory:**

**OpenStack** is an open-source cloud computing platform that provides **Infrastructure-as-a-Service (IaaS)**. Its networking component, **Neutron**, allows users to create and manage virtual networks, enabling communication between instances and external networks.

**OpenStack networking consists of the following key concepts:**

* **Networks:** Virtual networks that allow instances to communicate.
* **Subnets:** IP address pools assigned to networks.
* **Routers:** Used to connect private networks to external networks.
* **Floating IPs:** Public IPs assigned to instances for external access.
* **Security Groups:** Firewall rules to control traffic.

By creating a private network in OpenStack, users can ensure internal communication between instances while controlling access to external resources.

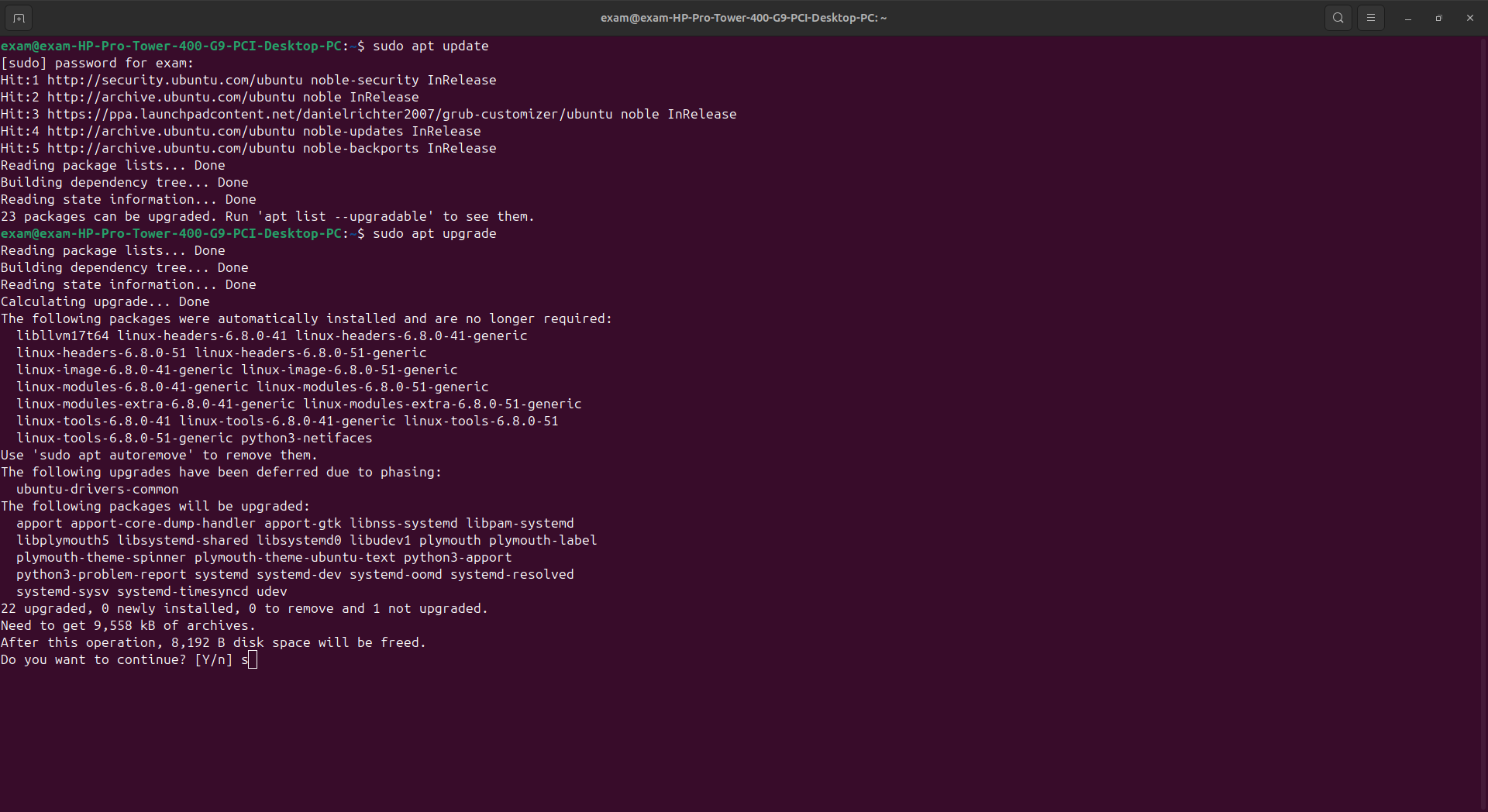
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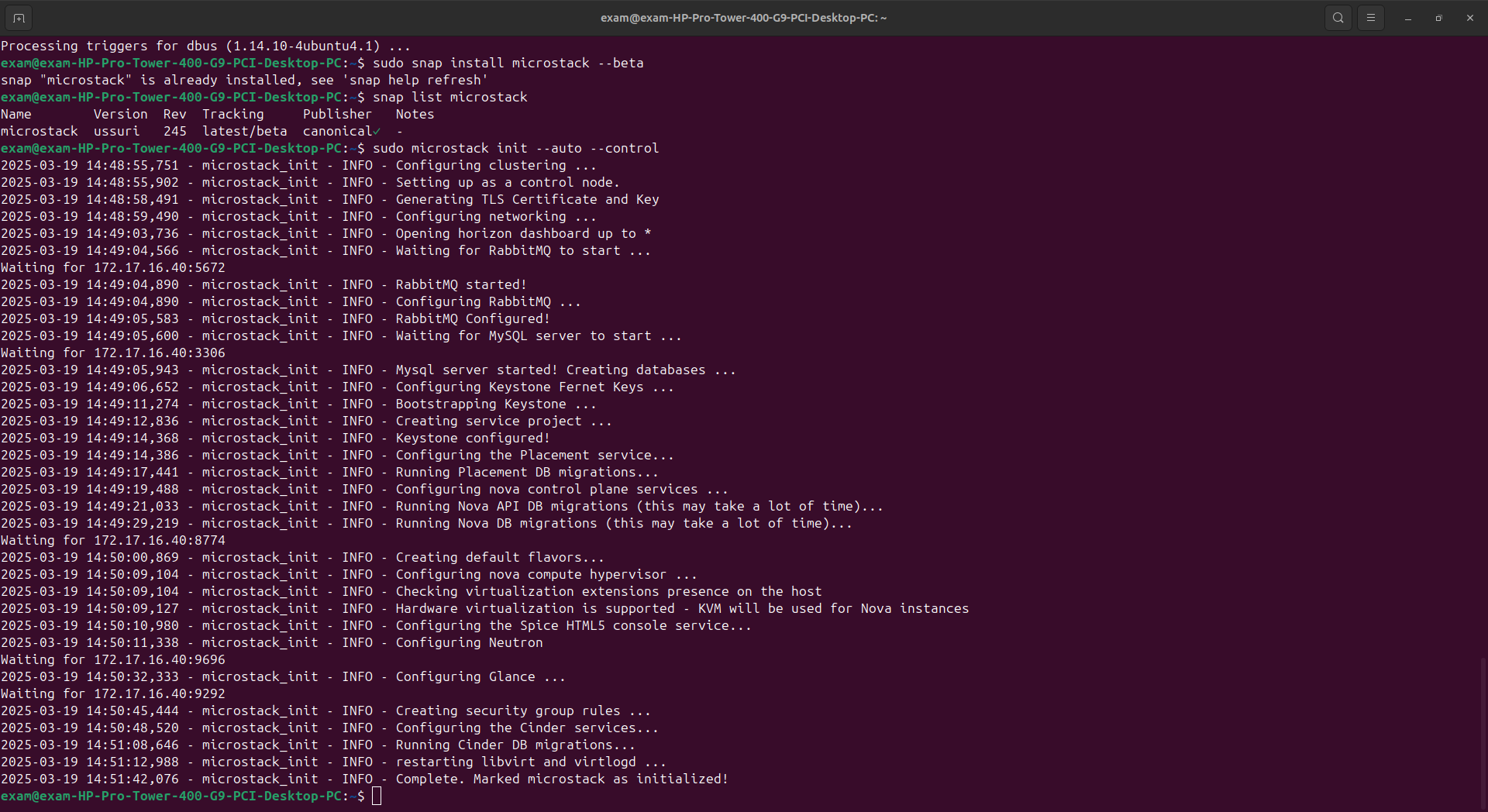
**Procedure:**

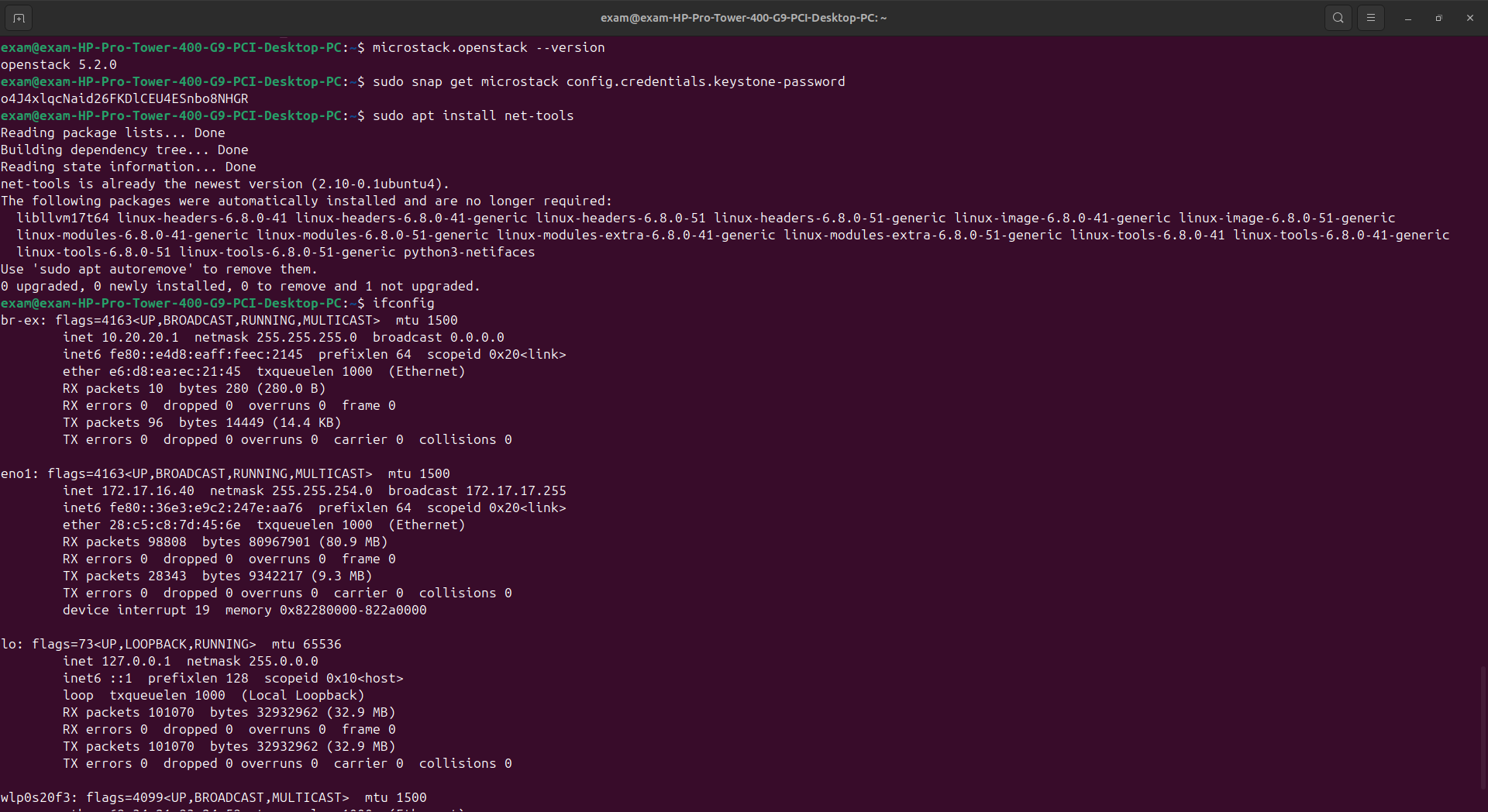
1. **Create a project**
2. **Create a User and Associate with Project**
3. **Upload a new image**
4. **Create a Private Network**
5. **Create a Route**
6. **Check network topology**

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**Result: (All steps with screenshots)**



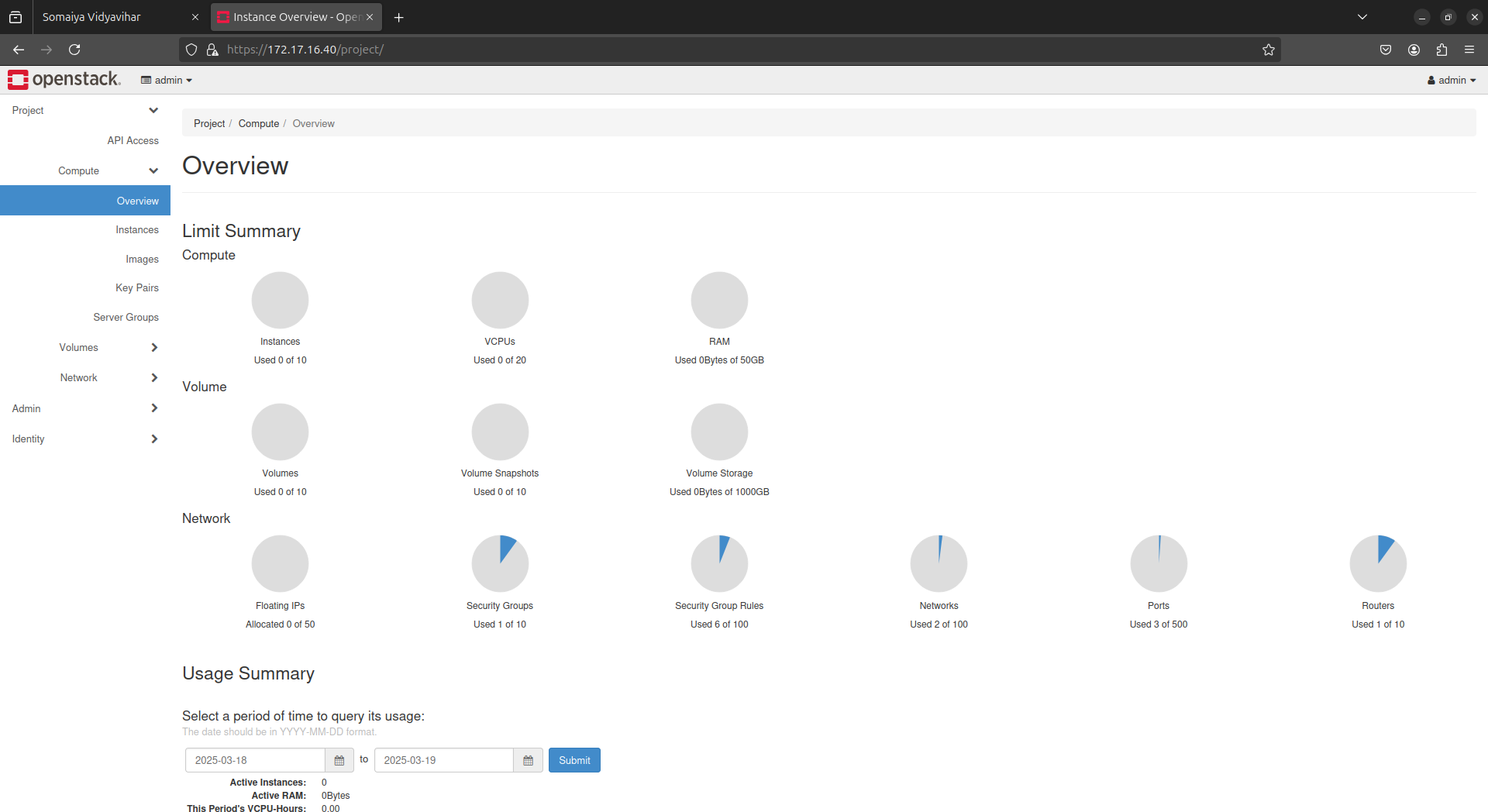


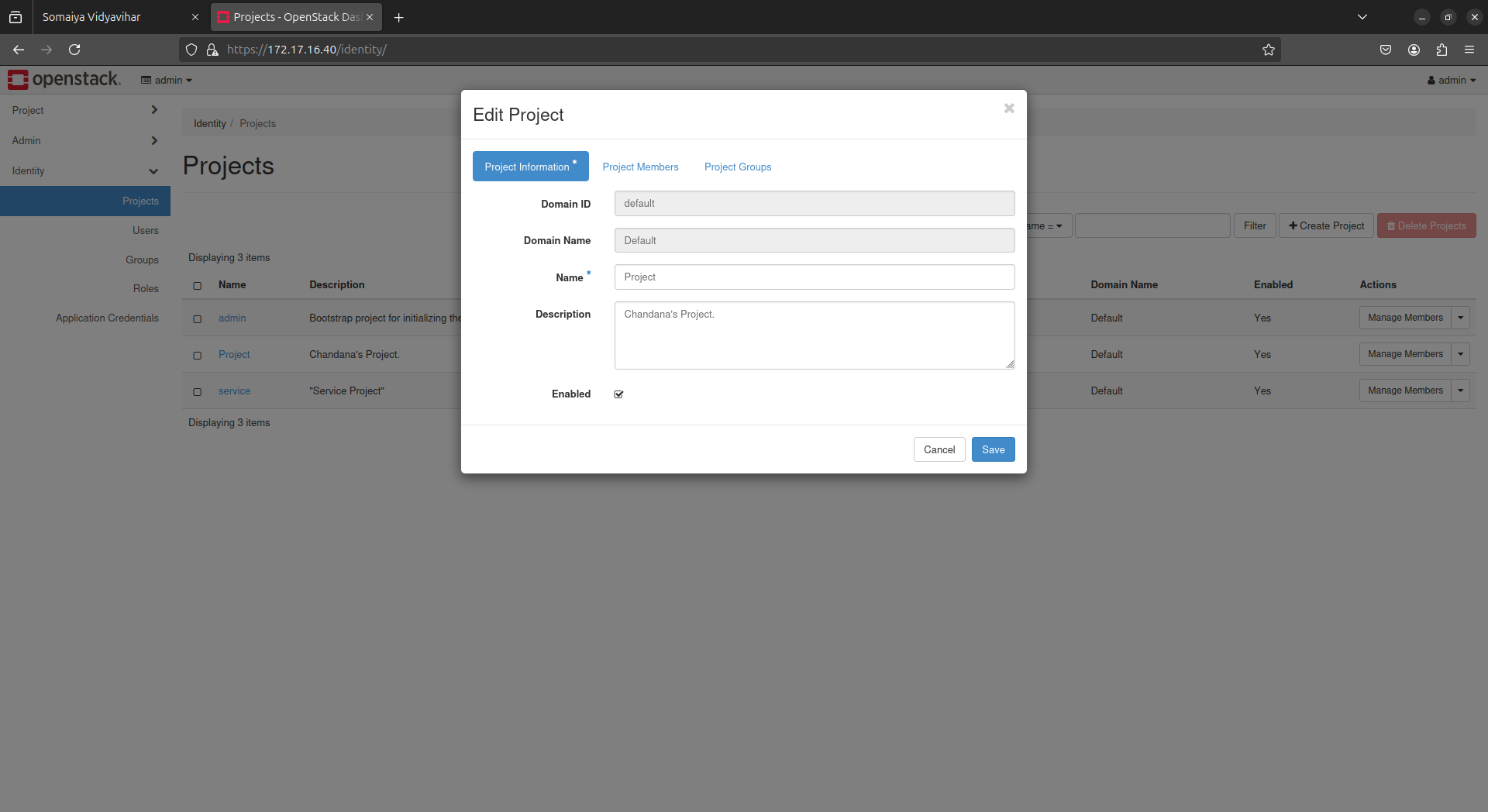


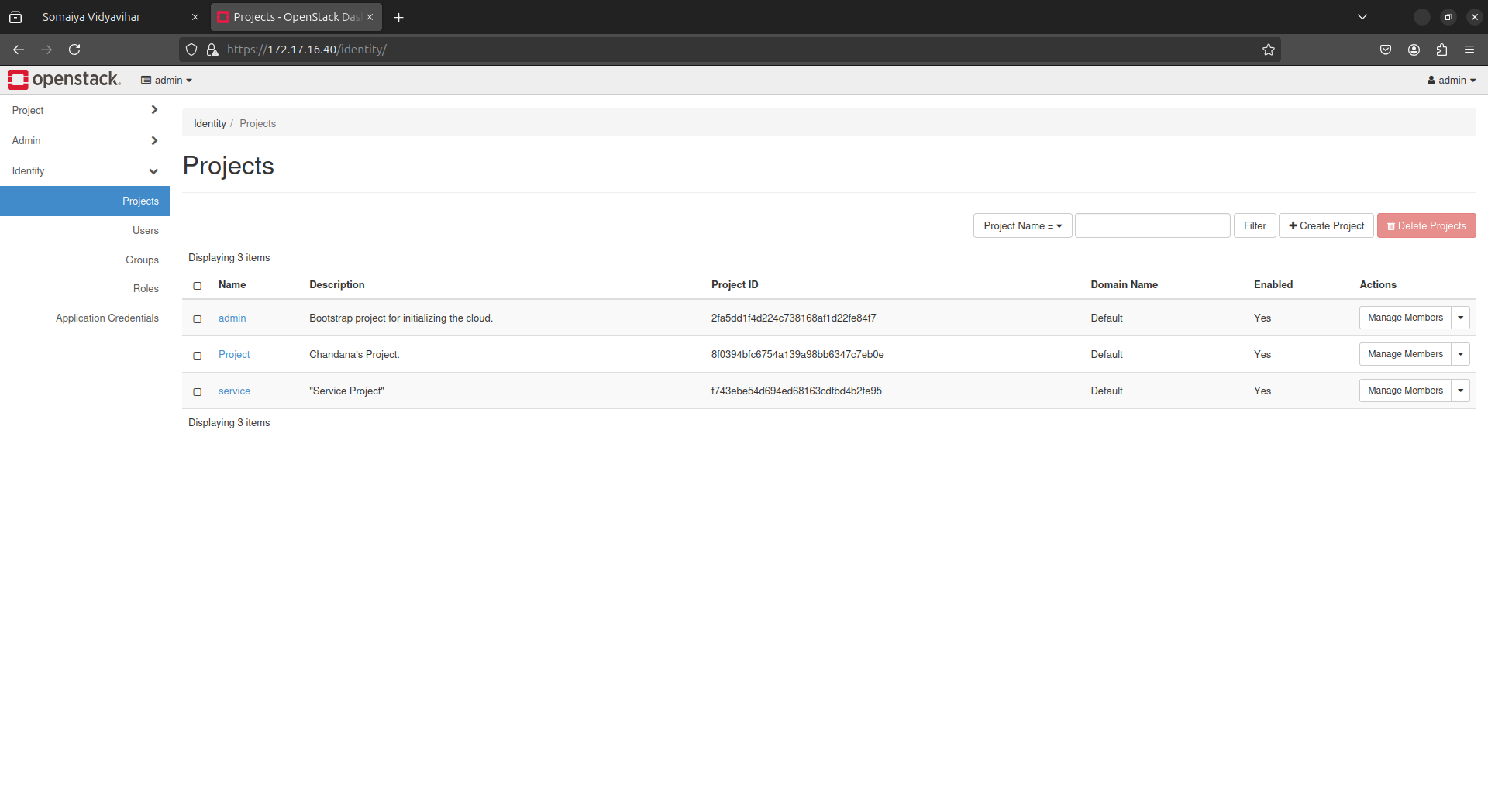
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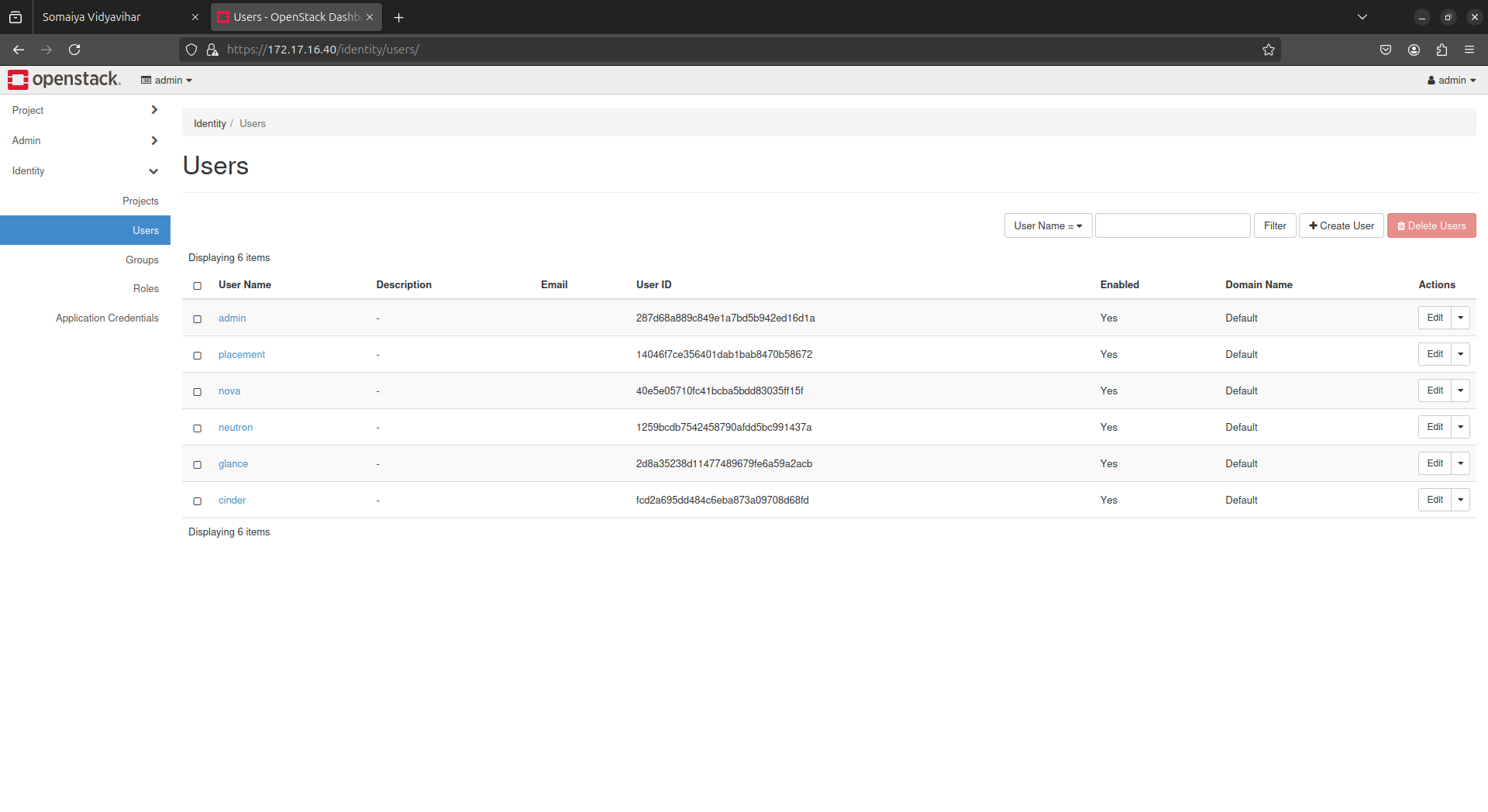
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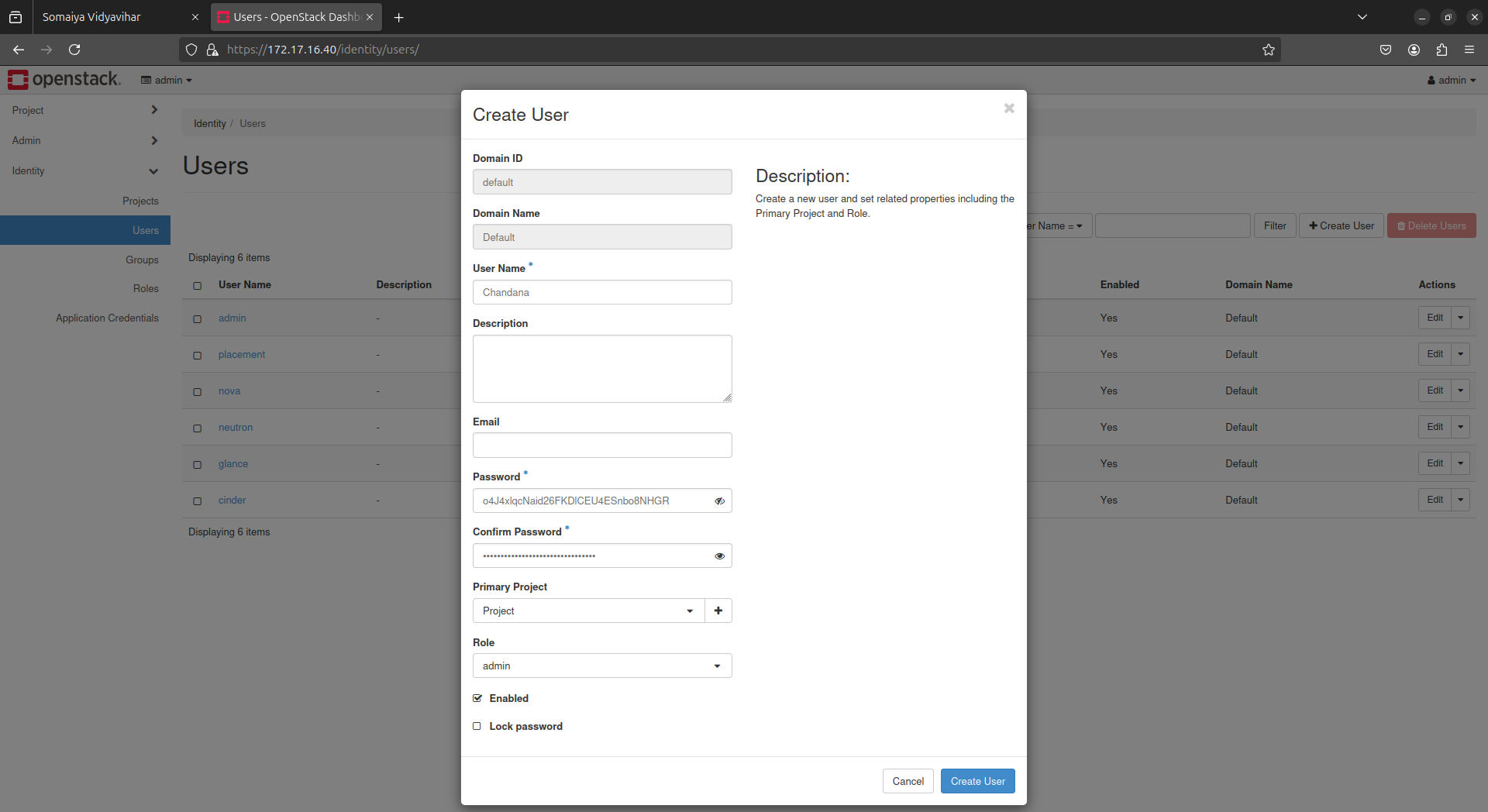
[**https://172.17.16.40/auth/login/?next=/project/**](https://172.17.16.40/auth/login/?next=/project/)

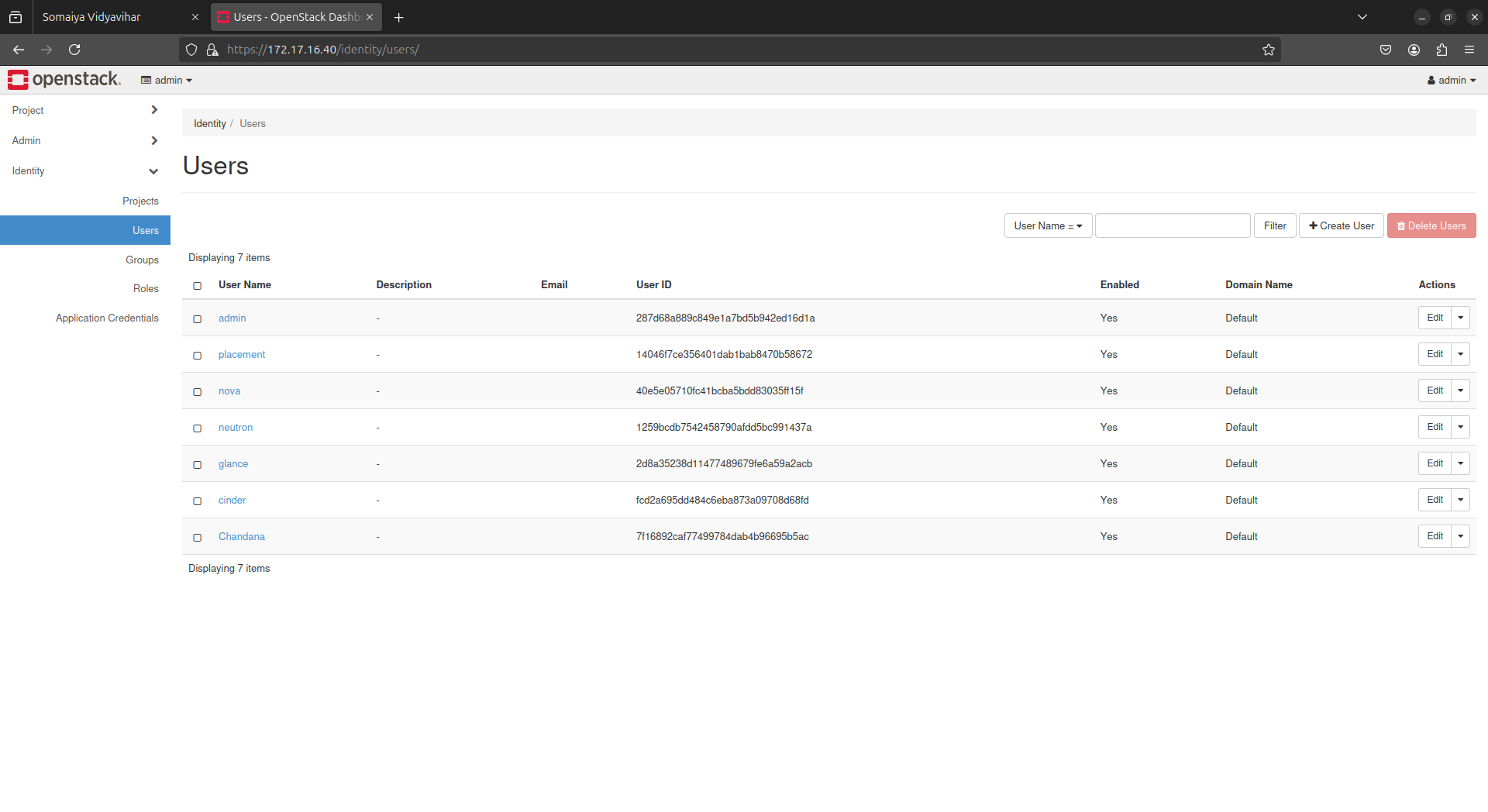


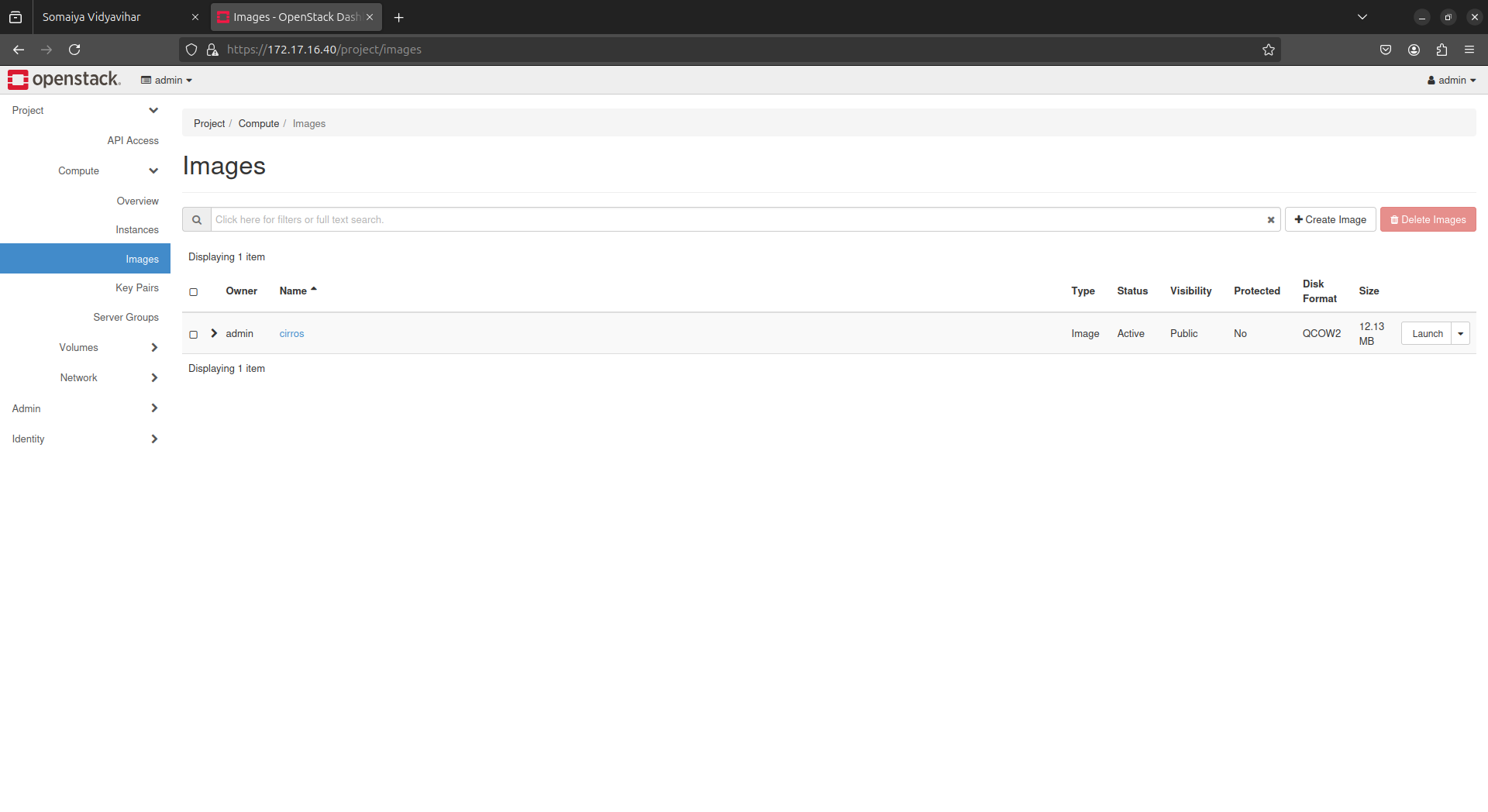


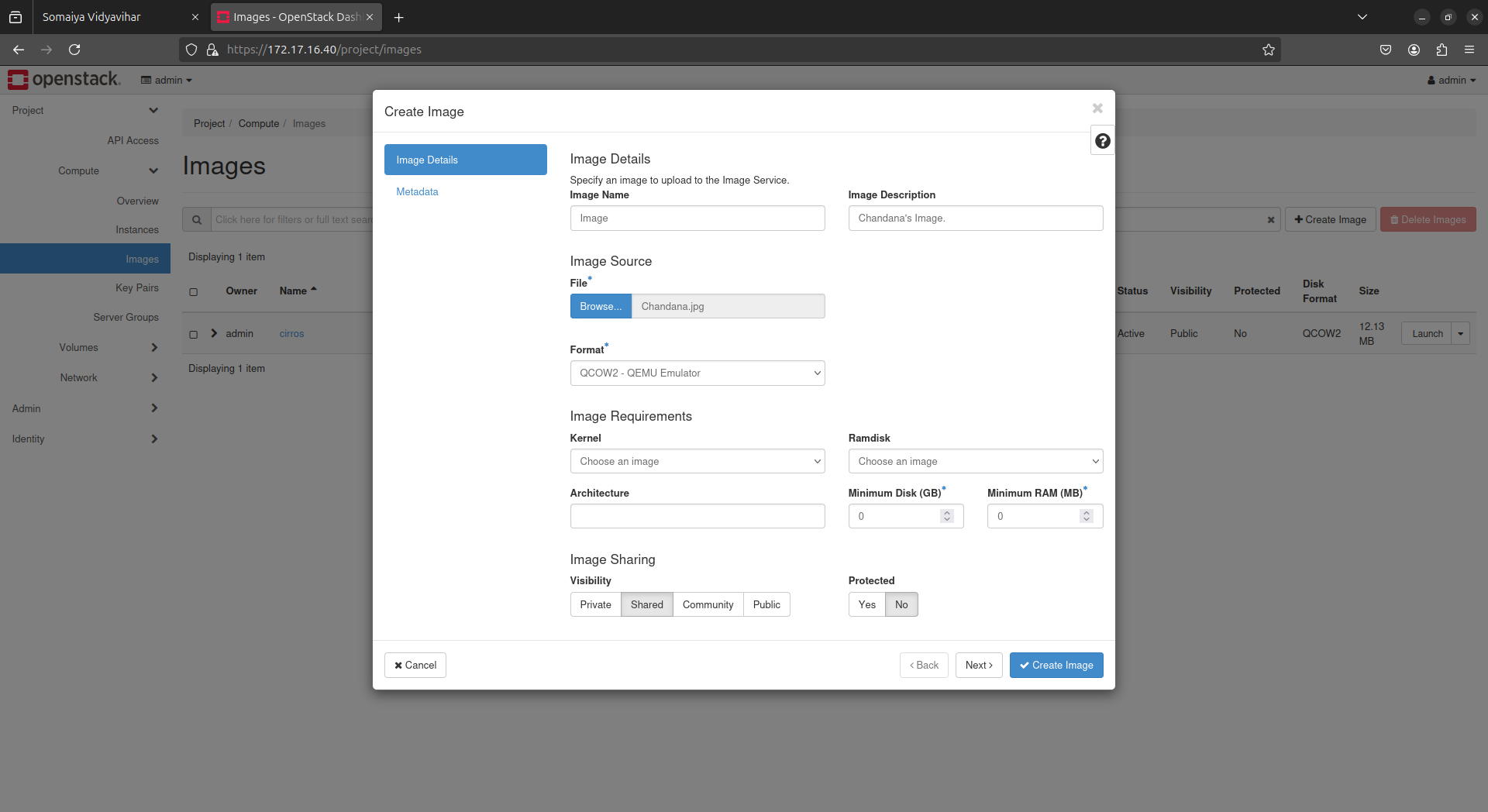


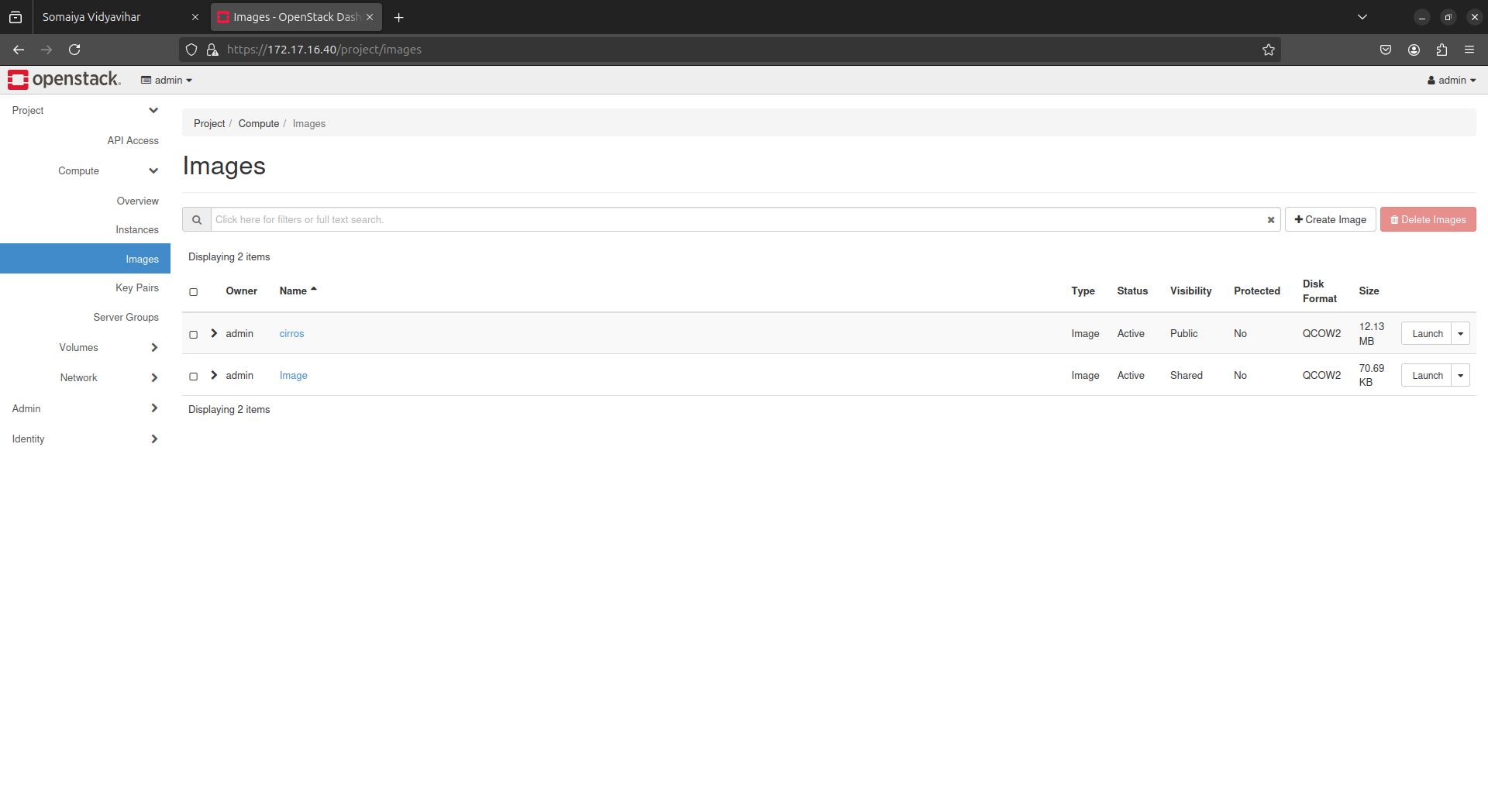


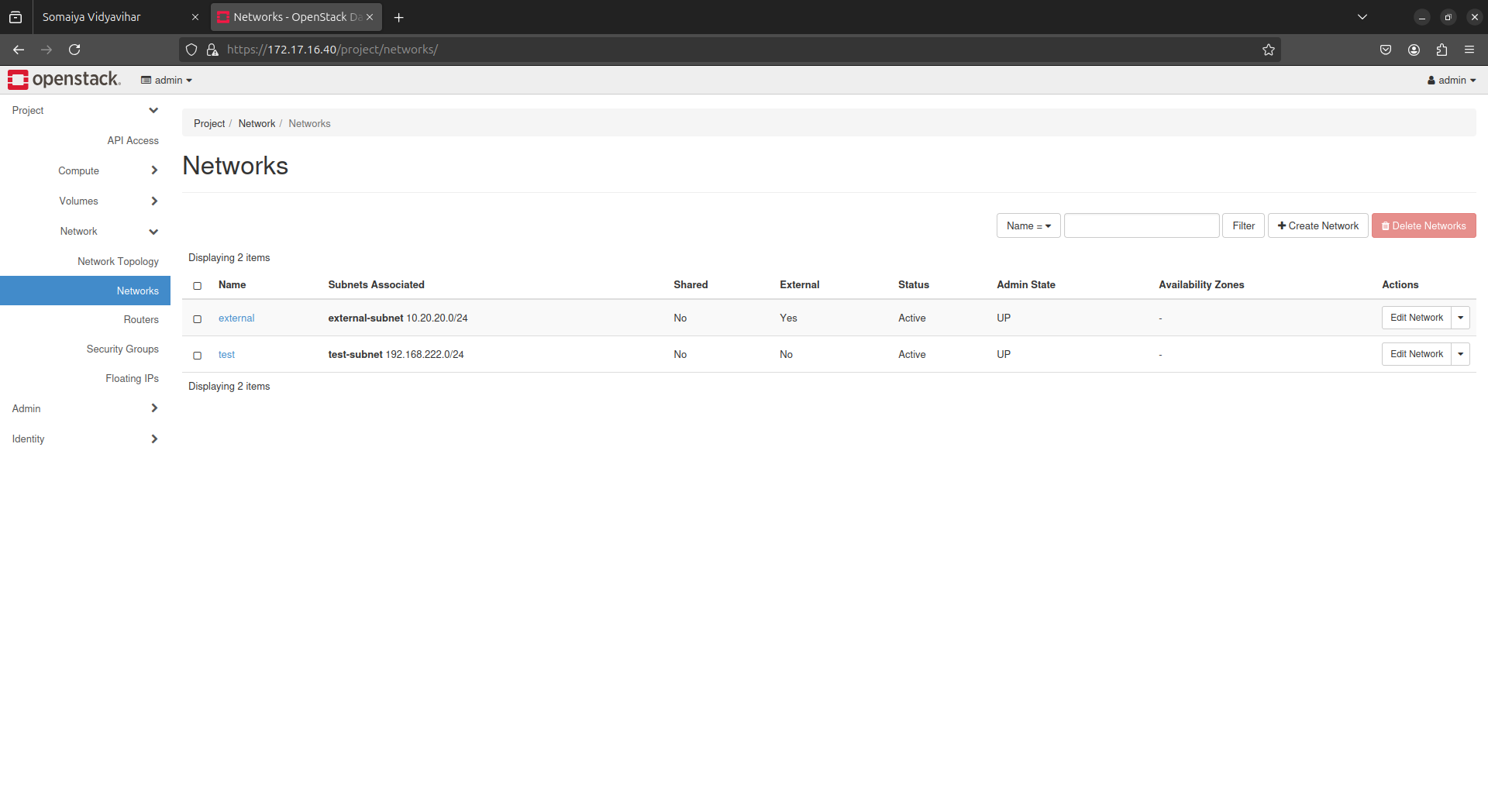


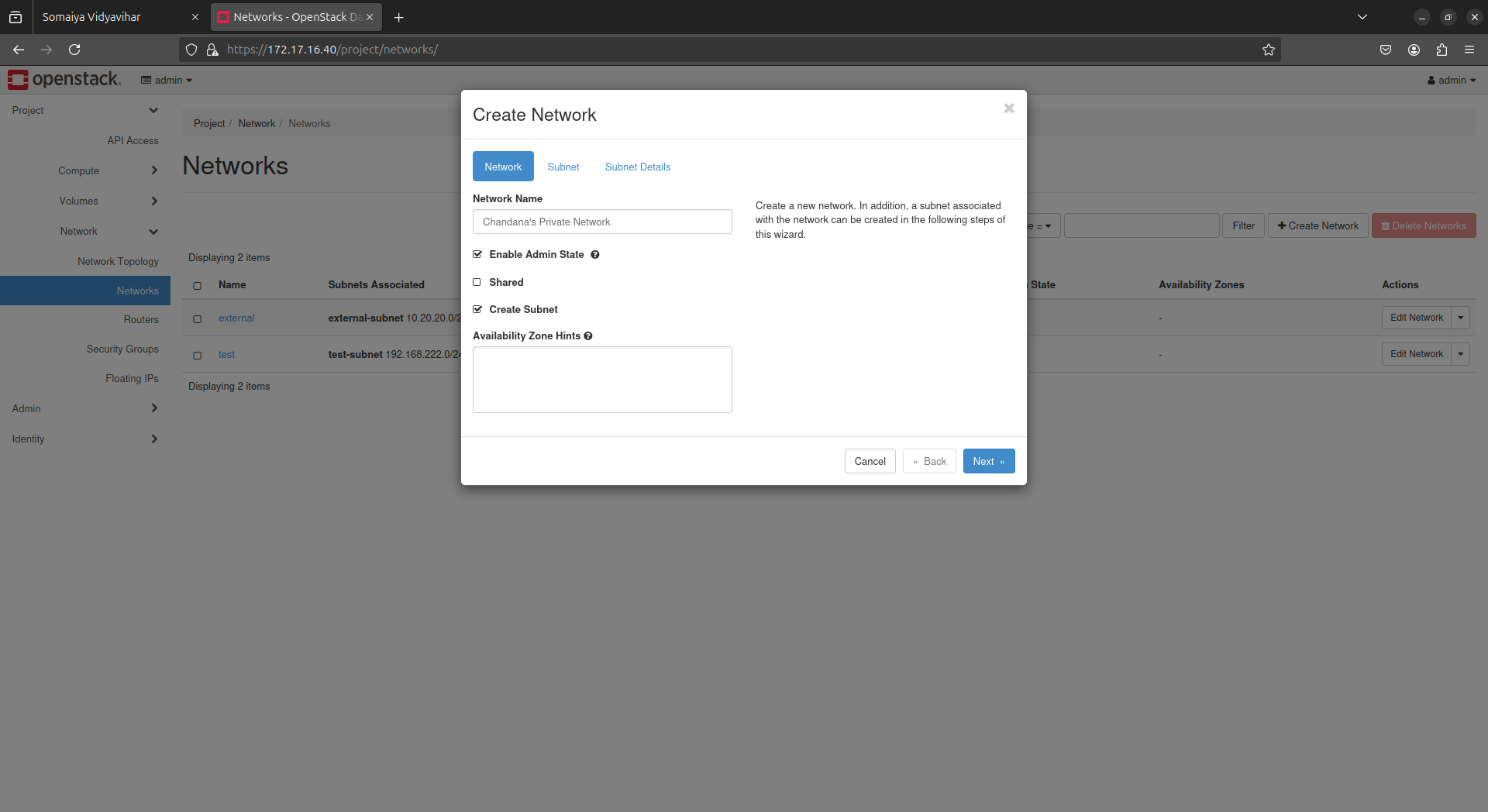


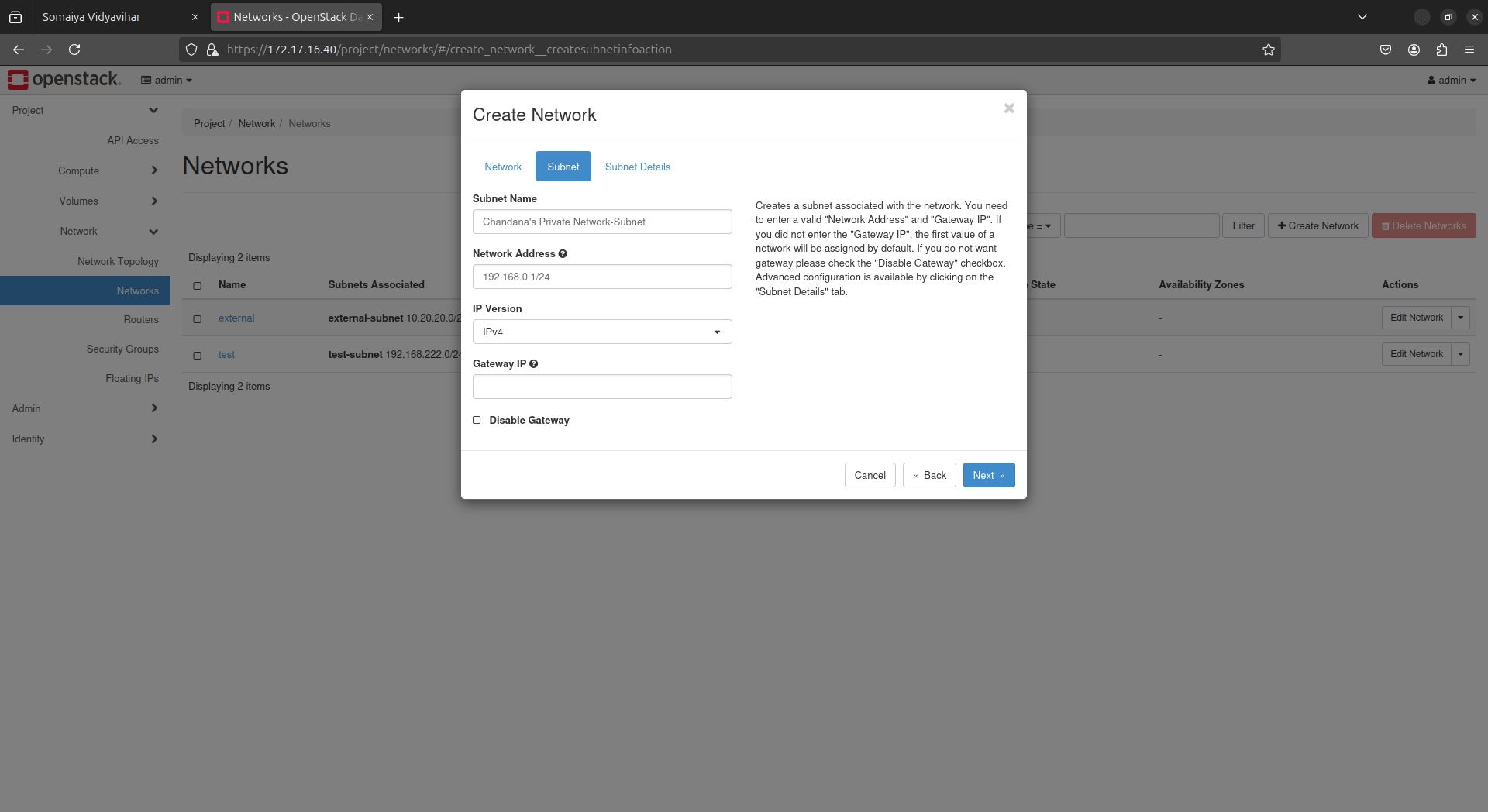


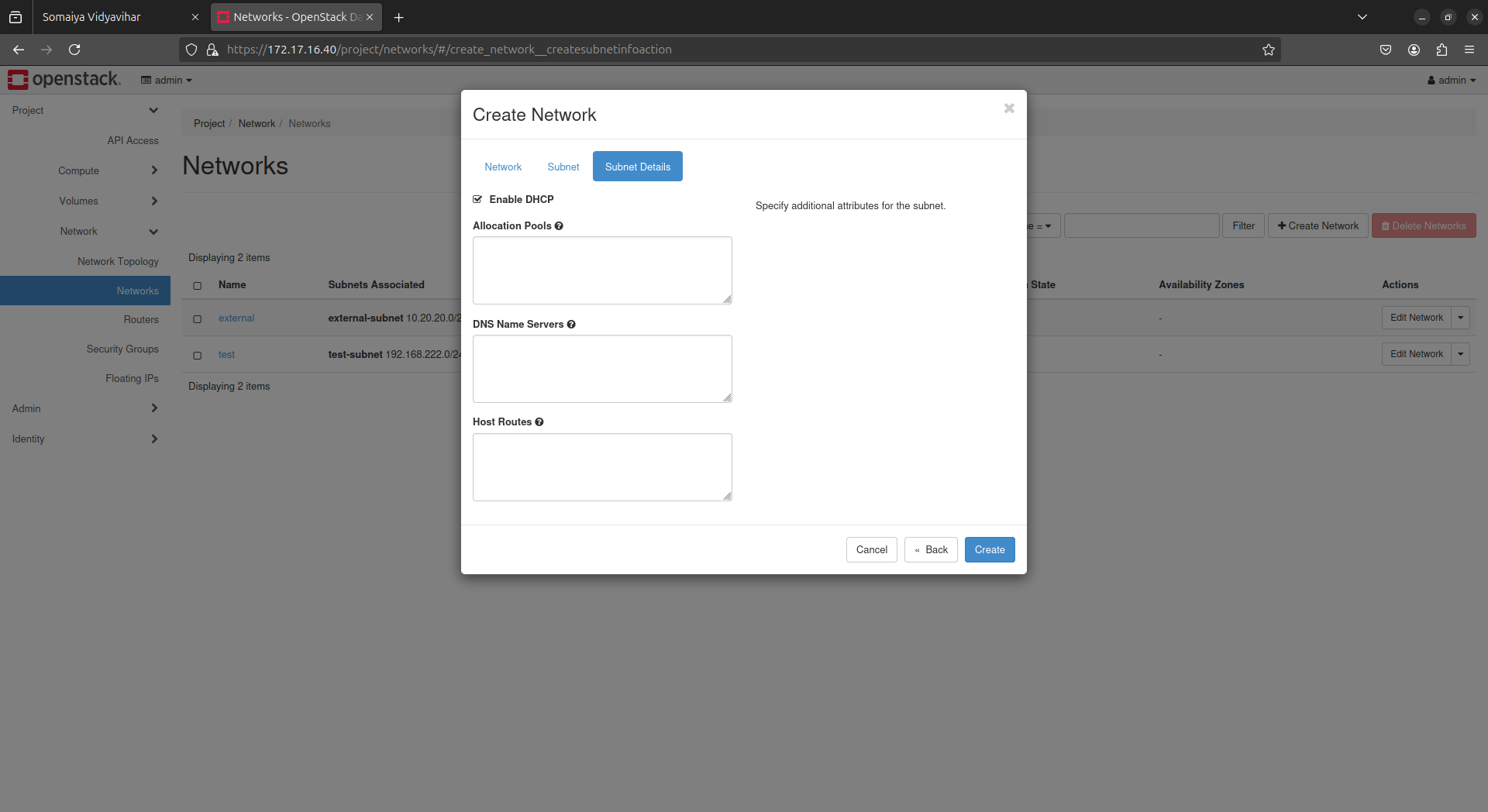


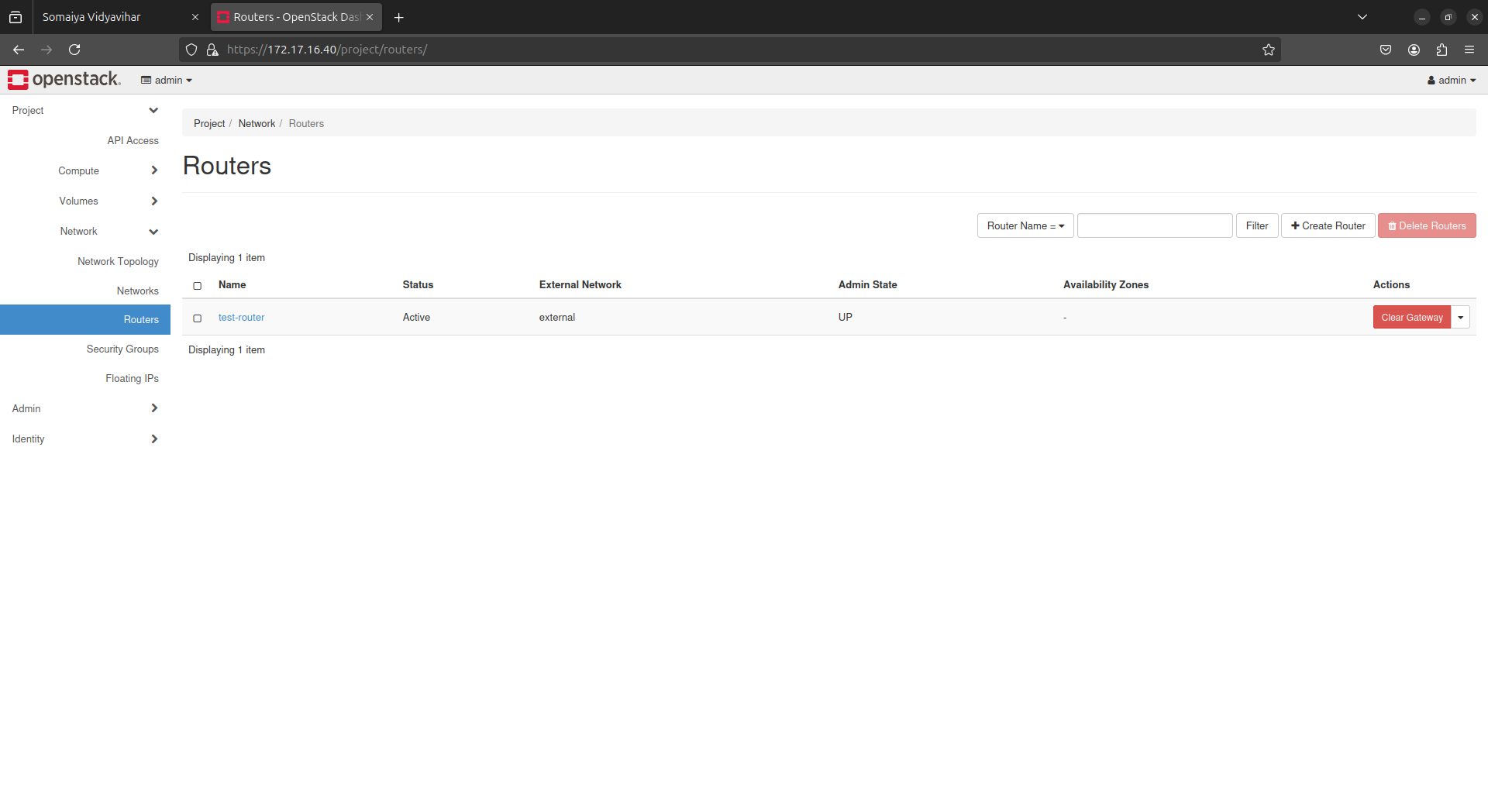


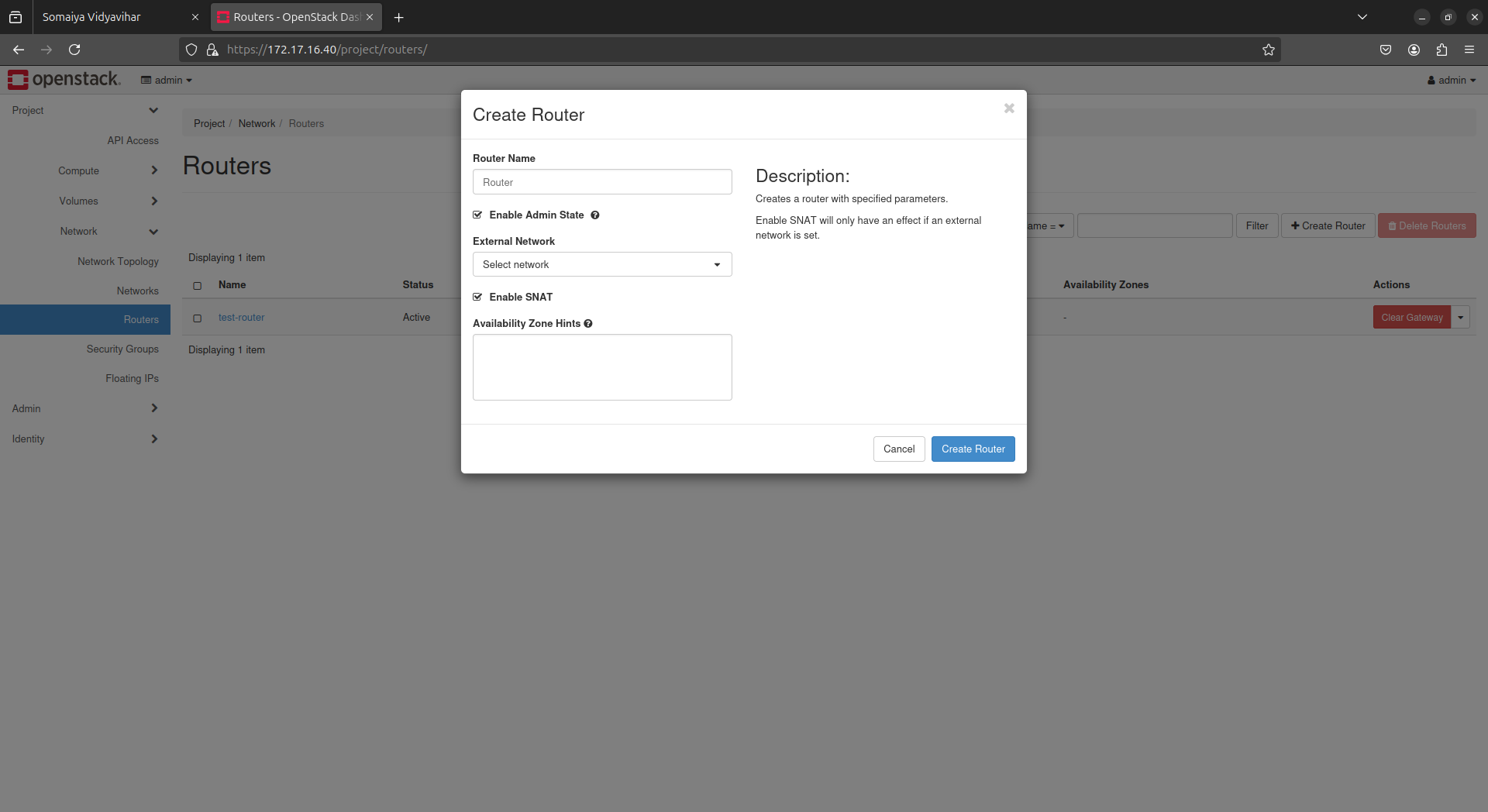


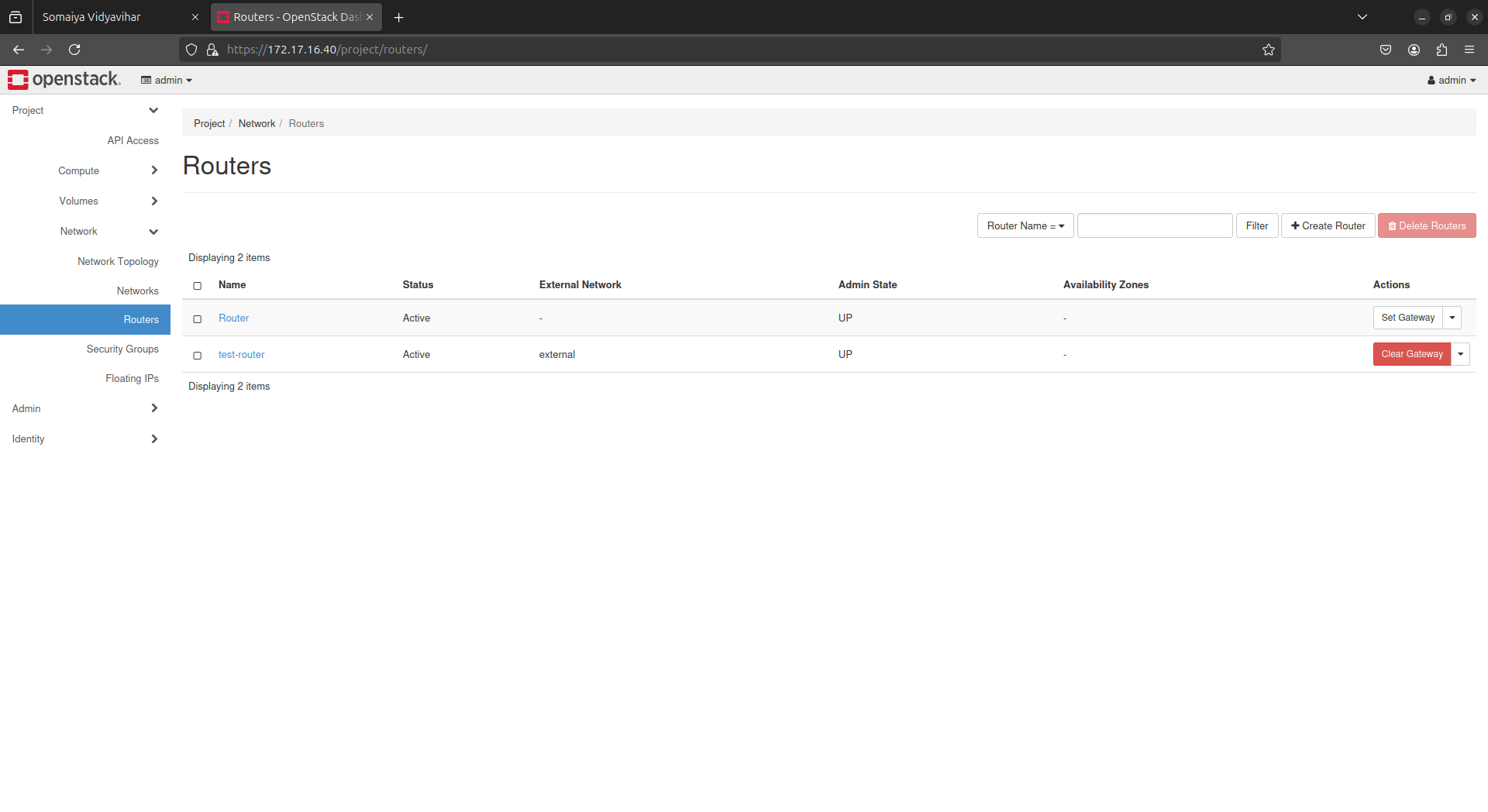


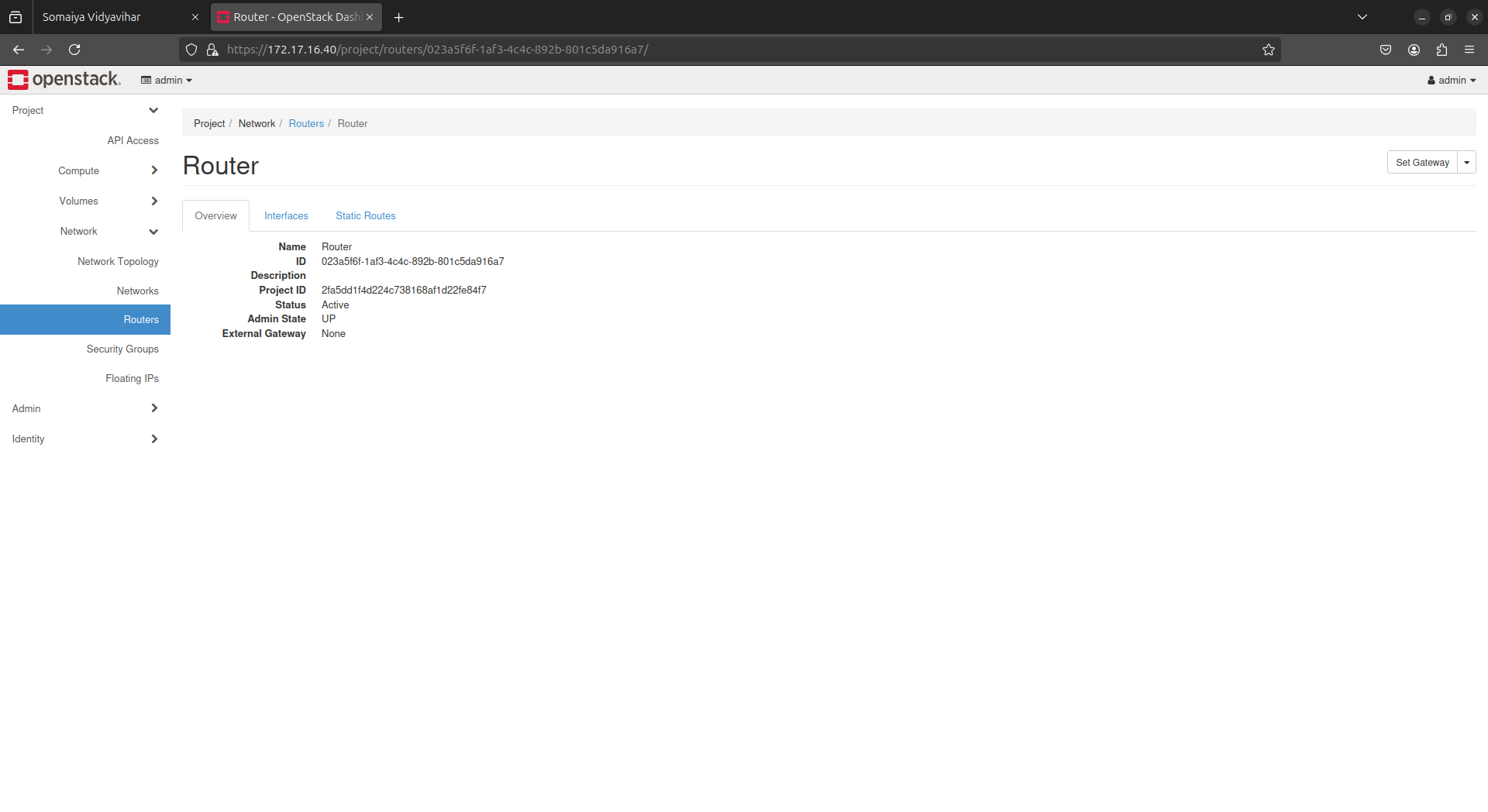


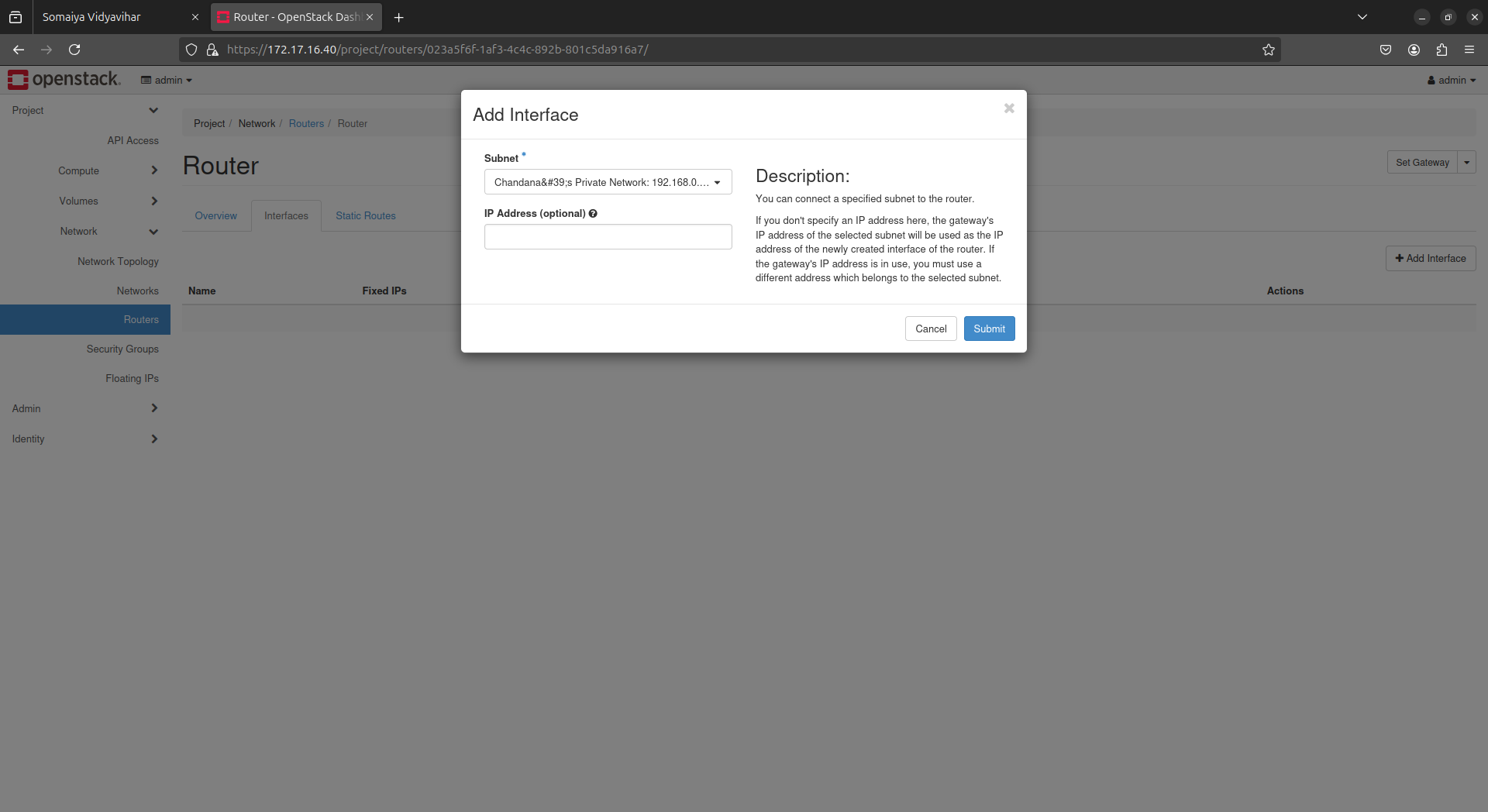


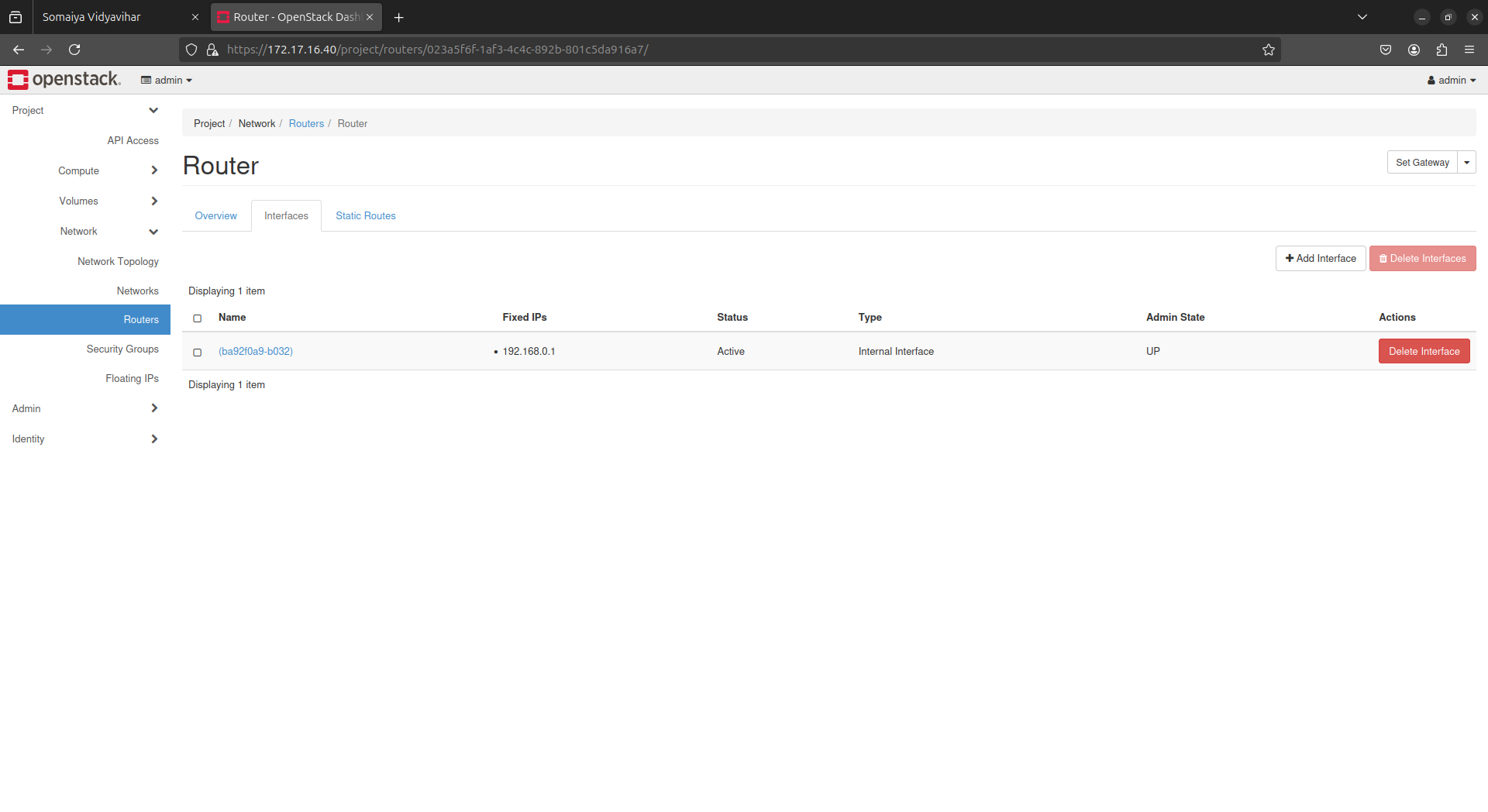


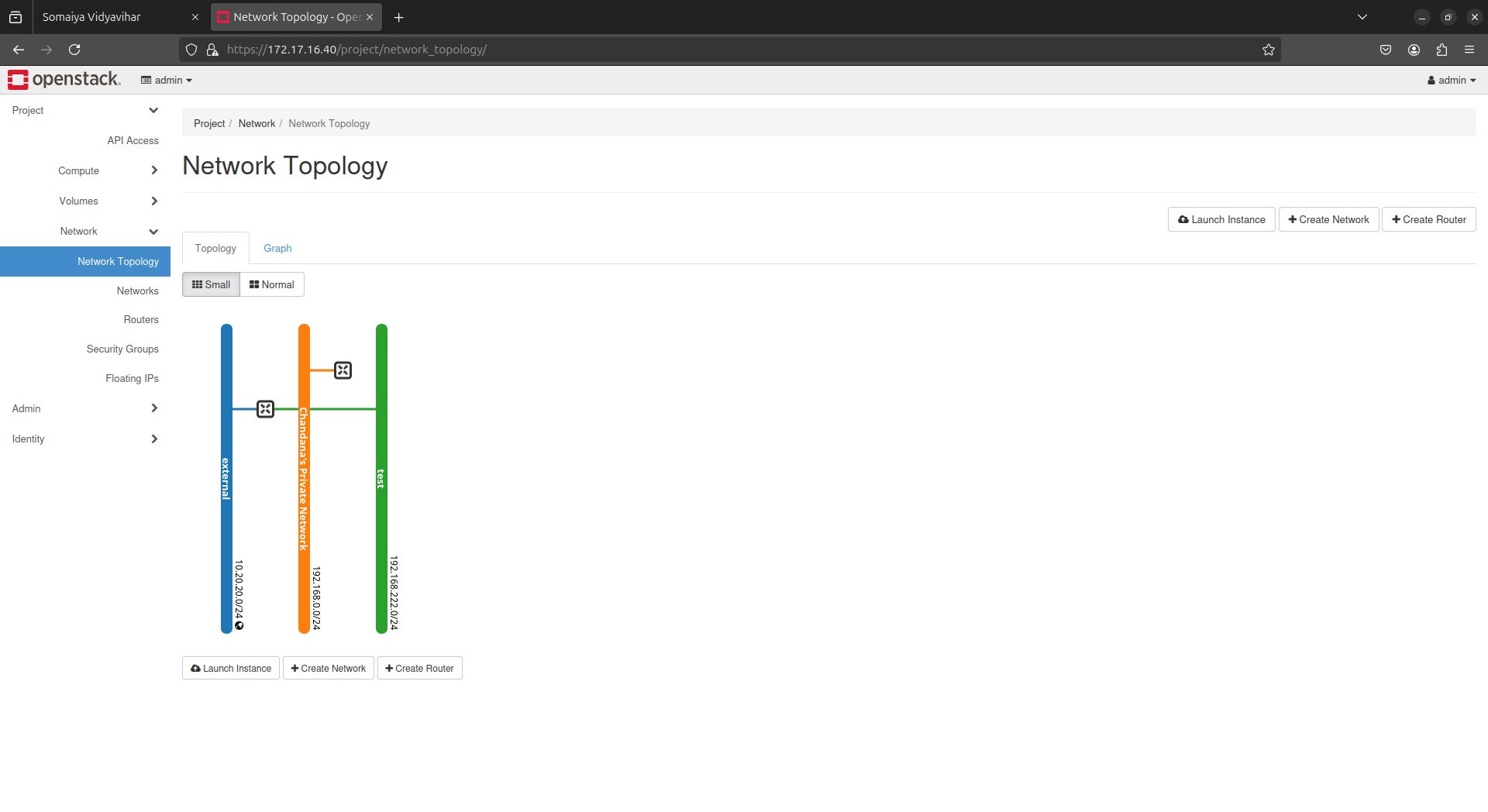


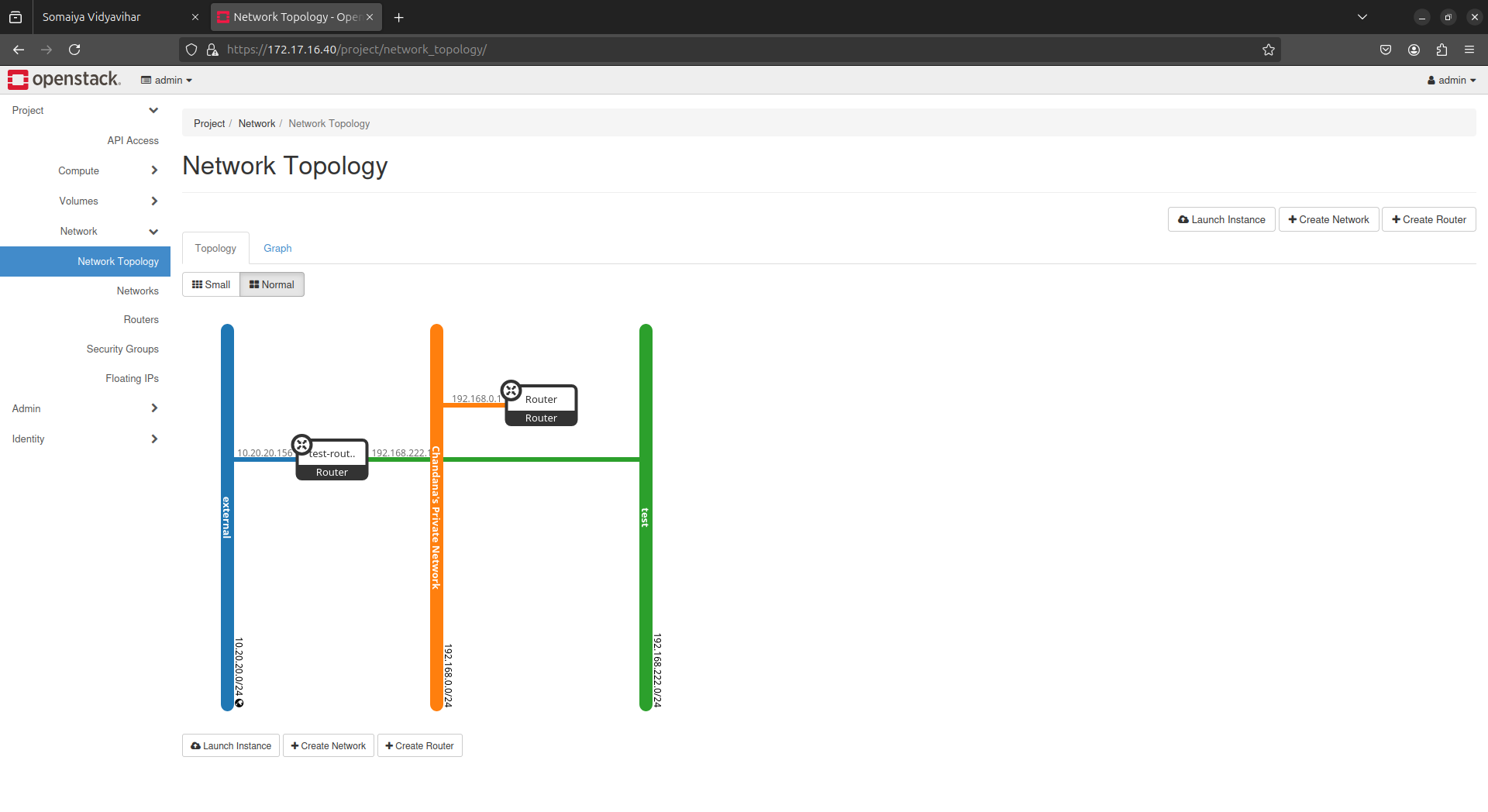


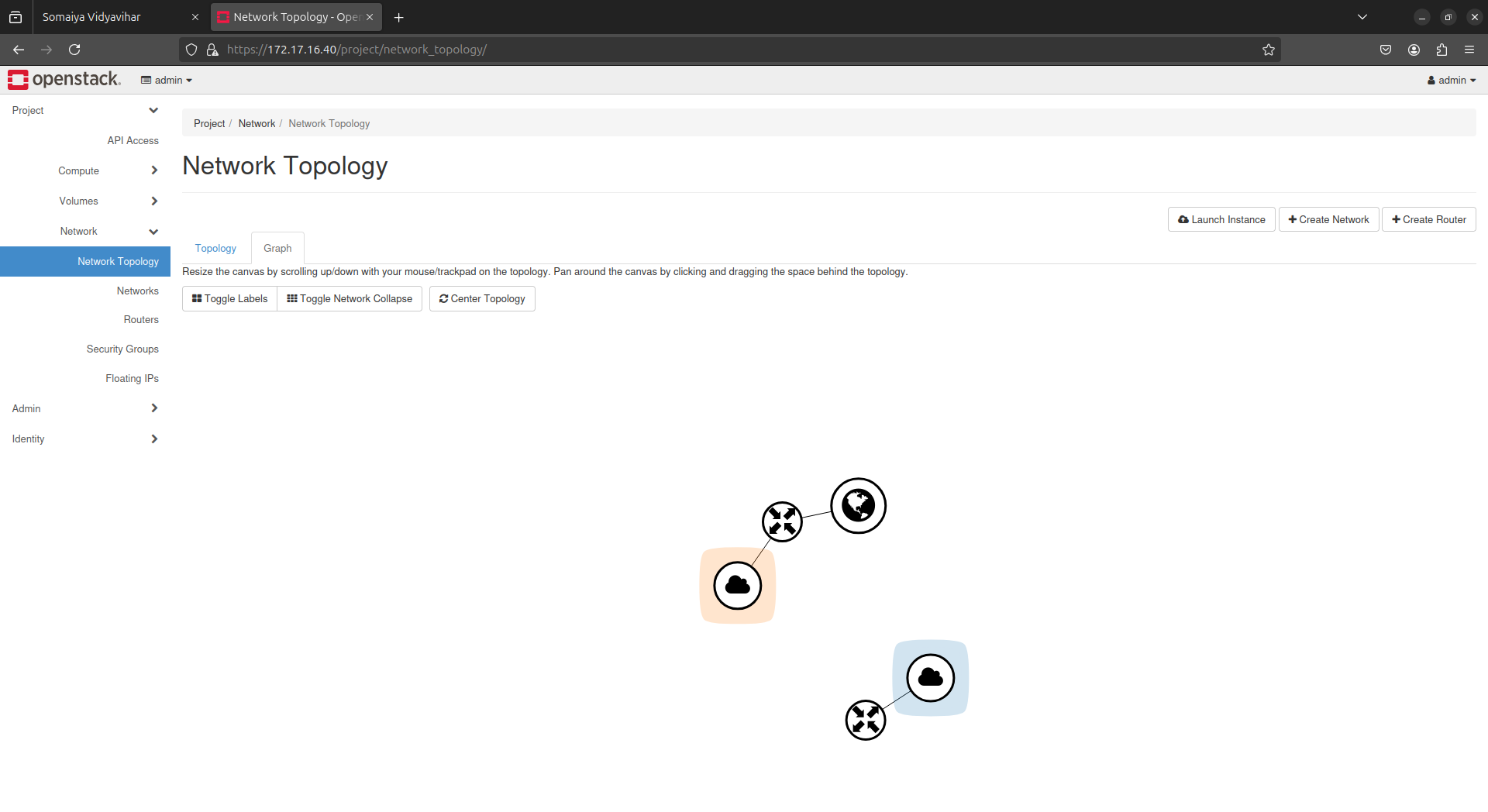












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**Questions:**

1. **Explain architecture of OpenStack.**

OpenStack follows a modular architecture with multiple components handling different cloud services. Key components include:

1. **Horizon (Dashboard):** A web-based UI to manage OpenStack resources.
2. **Nova (Compute):** Manages virtual machine instances.
3. **Neutron (Networking):** Handles networking services like private and public networks.
4. **Glance (Image Service):** Manages disk images used for instance creation.
5. **Cinder (Block Storage):** Provides persistent block storage.
6. **Swift (Object Storage):** Stores unstructured data like images and backups.
7. **Keystone (Identity Service):** Handles authentication and user roles.
8. **Heat (Orchestration):** Automates resource deployment using templates.
9. **Ceilometer (Telemetry):** Collects usage and performance data.

All components interact via APIs and work together to provide Infrastructure-as-a-Service (IaaS), supporting scalable and flexible cloud environments.

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**Outcomes: CO3 — Analyze different cloud architectures and IOT cloud**

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**Conclusion: (Conclusion to be based on the objectives and outcomes achieved)**

In this experiment, a private network was successfully created within OpenStack, following the steps of project creation, user association, image upload, and network configuration. The network topology was verified, ensuring proper connectivity. This experiment provided hands-on experience in managing OpenStack networking, reinforcing concepts of cloud architecture and client-server communication.

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**Grade: AA / AB / BB / BC / CC / CD / DD**

**Signature of faculty in-charge with date**

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**References:**

**1. Create a User and Project in OpenStack Horizon**

<https://openmetal.io/docs/manuals/operators-manual/day-1/horizon/create-user-project>

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