OpenStack Lab Exercise Answers - Compute Service (Nova)

# Q1: Launch a virtual machine (instance) in OpenStack. What is the process for selecting a flavor, an image, and a network?

Steps to Launch an Instance in OpenStack:  
  
1. \*\*Login to Horizon Dashboard or CLI:\*\*   
 - Access OpenStack via the web-based Horizon Dashboard or the command line interface (CLI).  
  
2. \*\*Go to the Compute Section:\*\*   
 - In Horizon, navigate to the \*\*"Project"\*\* tab and select \*\*"Instances"\*\* under \*\*"Compute"\*\*. In CLI, use the `openstack` command.  
  
3. \*\*Launch a New Instance:\*\*   
 - Click \*\*"Launch Instance"\*\* in Horizon or use the command `openstack server create` in the CLI.  
  
4. \*\*Select an Instance Name:\*\*   
 - Provide a name for the instance (e.g., "WebServer1").  
  
5. \*\*Choose an Image:\*\*   
 - Select the desired image from the available options. This image acts as the operating system for the instance (e.g., Ubuntu, CentOS, etc.).   
 - In the CLI, list available images with `openstack image list` and specify one using `--image <image\_id>`.  
  
6. \*\*Choose a Flavor:\*\*   
 - A flavor defines the instance’s compute resources, such as CPU, RAM, and disk space. Choose a flavor that fits the needs of your instance (e.g., `m1.small` for 2GB RAM, 1 vCPU).  
 - In the CLI, list available flavors using `openstack flavor list` and specify one using `--flavor <flavor\_id>`.  
  
7. \*\*Assign a Network:\*\*   
 - Choose the network that the instance will be connected to. It could be a public or private network depending on the configuration. If a floating IP is needed for external access, assign it later.  
 - In the CLI, specify the network using `--nic net-id=<network\_id>`.  
  
8. \*\*Security Groups and Key Pairs:\*\*   
 - Assign a security group that defines firewall rules for the instance (e.g., allow SSH and ICMP).  
 - Attach a key pair for secure SSH access to the instance.  
  
9. \*\*Launch the Instance:\*\*   
 - Click \*\*"Launch"\*\* to start the instance. In CLI, after specifying the parameters, run the command to launch the instance.

# Q2: Create a snapshot of a running instance. How can you restore the instance from this snapshot?

Steps to Create a Snapshot of a Running Instance:  
  
1. \*\*Navigate to the Instance:\*\*   
 - Go to the \*\*"Instances"\*\* section in Horizon or use the CLI to manage your instances.  
  
2. \*\*Create a Snapshot:\*\*   
 - In Horizon, click on the \*\*"Create Snapshot"\*\* option for the running instance.   
 - In CLI, use the command:  
 ```  
 openstack server image create --name <snapshot\_name> <instance\_id>  
 ```  
 - Provide a name for the snapshot (e.g., "WebServerSnapshot1").  
  
3. \*\*Verify Snapshot Creation:\*\*   
 - In Horizon, check the \*\*"Images"\*\* section to verify that the snapshot has been created successfully.  
 - In CLI, list images using:  
 ```  
 openstack image list  
 ```  
  
Steps to Restore an Instance from a Snapshot:  
  
1. \*\*Launch a New Instance from the Snapshot:\*\*   
 - Go to the \*\*"Images"\*\* section in Horizon and locate the snapshot you created. Click \*\*"Launch"\*\* to start a new instance based on this snapshot.  
 - In CLI, use the `openstack server create` command with the snapshot image ID:  
 ```  
 openstack server create --flavor <flavor\_id> --image <snapshot\_id> --network <network\_id> <new\_instance\_name>  
 ```  
  
2. \*\*Assign Network and Security Groups:\*\*   
 - During the launch process, ensure that the new instance is connected to the appropriate network and assigned security groups just like launching any other instance.  
  
3. \*\*Access the Restored Instance:\*\*   
 - Once launched, the new instance will be a replica of the original instance at the time of the snapshot.

# Q3: Resize an instance to a different flavor. What are the implications of resizing, and how does OpenStack manage this process?

Steps to Resize an Instance:  
  
1. \*\*Choose the Instance to Resize:\*\*   
 - In Horizon, go to the \*\*"Instances"\*\* section and click \*\*"Resize Instance"\*\* for the instance you want to resize.  
 - In CLI, use the following command:  
 ```  
 openstack server resize --flavor <new\_flavor\_id> <instance\_id>  
 ```  
  
2. \*\*Select a New Flavor:\*\*   
 - Choose the new flavor that matches the new CPU, RAM, and disk requirements.  
  
3. \*\*Confirm the Resize:\*\*   
 - After the resize operation, you must confirm it. If using Horizon, click \*\*"Confirm Resize"\*\* once the operation is completed.  
 - In CLI, use:  
 ```  
 openstack server resize confirm <instance\_id>  
 ```  
  
Implications of Resizing:  
  
- \*\*Temporary Downtime:\*\* Resizing an instance will result in downtime as OpenStack stops the instance during the resize operation.  
- \*\*Upgrades/Downgrades:\*\* Resizing can be used to upgrade or downgrade resources. Upgrading might increase performance, while downgrading could lead to resource constraints.  
- \*\*Data Preservation:\*\* OpenStack preserves the instance’s data, but resizing may affect performance depending on disk space and memory changes.  
- \*\*Manual Rollback (Optional):\*\* If the resize is unsuccessful or the new flavor does not fit your needs, you can revert back to the original flavor with the following command:  
 ```  
 openstack server resize revert <instance\_id>  
 ```  
  
How OpenStack Manages Resizing:  
  
- \*\*Stop Instance:\*\* OpenStack stops the instance temporarily during the resize.  
- \*\*Migrate/Resize:\*\* The underlying resources (CPU, memory, etc.) are adjusted based on the new flavor. This can involve live migration to another compute node if required.  
- \*\*Confirm or Revert:\*\* Once the resize is complete, the user must either confirm the resize to make the changes permanent or revert to the original configuration if needed.