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CLOUD APPLICATION DEVELOPMENT

OPENSTACK LAB EXPERIMENT – 08

OBJECTIVE: Implementing Resource Allocation using OpenStack's Nova Compute Service

Introduction:

OpenStack's Nova Compute Service is a core component of the OpenStack cloud platform, providing the ability to create and manage virtual machines (VMs). One of the key features of Nova is resource allocation, which allows administrators to allocate CPU, memory, and storage resources to VMs based on their specific needs. In this lab report, we will explore how to implement resource allocation using OpenStack's Nova Compute Service.

Prerequisites:

To follow along with this lab, you will need access to an OpenStack cloud and an account with sufficient permissions to create and manage VMs.

Implementing Resource Allocation:

1. Create Flavors:
    - In OpenStack, a flavor is a predefined set of resources (such as CPU, memory, and storage) that can be assigned to a VM.
    - To create a flavor, navigate to the "Flavors" tab in the OpenStack dashboard and click "Create Flavor."
    - Specify the flavor name, vCPUs, RAM, and disk space, and click "Create Flavor" to create the new flavor.
2. Launch VMs with Specific Flavors:

- To allocate resources to VMs, you will need to launch VMs with specific flavors.
- In the OpenStack dashboard, navigate to the "Instances" tab and click "Launch Instance."
- Select the desired flavor for the VM and specify any other required settings, such as security groups and SSH key pairs.
- Click "Launch" to create the VM with the specified flavor.

3. Monitor Resource Usage:
    - Once VMs are launched with specific flavors, you can monitor resource usage to ensure that the allocated resources are being used effectively.
    - In the OpenStack dashboard, navigate to the "Compute" tab and click "Instances."
    - Click on the name of the VM you want to monitor to view its details.
    - Under the "Overview" tab, you can view resource usage, including CPU, memory, and disk usage.
4. Resize VMs:
    - If you find that a VM is not using its allocated resources effectively, you can resize the VM to allocate more or fewer resources as needed.
    - In the OpenStack dashboard, navigate to the "Compute" tab and click "Instances."
    - Click on the name of the VM you want to resize to view its details.
    - Click the "Resize" button and select the new flavor for the VM.
    - Click "Resize" to apply the changes to the VM.
5. Manage Resource Quotas:
    - To prevent users from consuming too many resources, you can set quotas for resources in OpenStack.
    - In the OpenStack dashboard, navigate to the "Compute" tab and click "Quotas."
    - Select the project for which you want to set quotas and specify the maximum number of resources that can be used (such as maximum number of VMs or maximum amount of CPU usage).
    - Click "Update Quota" to apply the new quotas.

Conclusion:

Implementing resource allocation using OpenStack's Nova Compute Service is an important feature for managing VMs in an OpenStack cloud. By creating flavors with specific resource allocations and monitoring resource usage, administrators can ensure that VMs are using resources effectively. Additionally, by resizing VMs and setting resource quotas, administrators can manage resource usage and prevent users from consuming too many resources. Overall, resource allocation is an important tool for ensuring the efficient and effective use of resources in an OpenStack cloud.