# Method of Procedure (MOP) for Deploying a VM on OpenStack with HAProxy Load Balancer

## Document Control

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## Purpose

This MOP outlines the detailed steps to deploy a Virtual Machine (VM) on OpenStack with specific memory and CPU configurations, set a designated node name, assign a specific IP address, and install and configure HAProxy for load balancing between specified servers.

## Prerequisites

- Access to an OpenStack environment with appropriate permissions to create VMs.

- OpenStack CLI or Horizon dashboard access.

- A list of servers to be load balanced by HAProxy.

- Basic knowledge of Linux commands and networking.

## Reference

- OpenStack Documentation: https://docs.openstack.org/

- HAProxy Documentation: http://www.haproxy.org/

## Procedure

### Step 1: Prepare the Environment

1. \*\*Log in to OpenStack:\*\*

- Use the OpenStack CLI or Horizon dashboard to log in to your OpenStack environment.

2. \*\*Gather Required Information:\*\*

- Node Name: Specify the desired name for the VM.

- Memory: Specify the amount of RAM (in MB) to allocate (e.g., 2048 for 2GB).

- CPU: Specify the number of CPU cores to allocate (e.g., 2).

- IP Address: Specify the static IP address to assign to the VM (e.g., 192.168.1.10).

- Security Group: Ensure that the security group allows traffic on the necessary ports (e.g., 80, 443 for HTTP/HTTPS).

### Step 2: Create the VM

1. \*\*Using OpenStack CLI:\*\*

- Open a terminal and source your OpenStack credentials:

```bash

source /path/to/your/openrc.sh

```

- Create the VM with the specified parameters:

```bash

openstack server create --flavor <flavor-name> --image <image-name> --key-name <key-name> --security-group <security-group> --nic net-id=<network-id>,v4-fixed-ip=<IP\_ADDRESS> <NODE\_NAME>

```

- Replace `<flavor-name>`, `<image-name>`, `<key-name>`, `<security-group>`, `<network-id>`, `<IP\_ADDRESS>`, and `<NODE\_NAME>` with your specific values.

2. \*\*Using Horizon Dashboard:\*\*

- Navigate to the "Instances" section.

- Click on "Launch Instance."

- Fill in the instance details:

- \*\*Instance Name:\*\* Enter the desired node name.

- \*\*Flavor:\*\* Select the flavor that matches your memory and CPU requirements.

- \*\*Image:\*\* Select the desired image.

- \*\*Key Pair:\*\* Select your SSH key pair.

- \*\*Networking:\*\* Select the appropriate network and assign the static IP address.

- Click "Launch Instance."

### Step 3: Access the VM

1. \*\*SSH into the VM:\*\*

- Use SSH to connect to the VM using the assigned IP address:

```bash

ssh -i /path/to/your/private\_key username@<IP\_ADDRESS>

```

### Step 4: Install HAProxy

1. \*\*Update Package List:\*\*

```bash

sudo apt update

```

2. \*\*Install HAProxy:\*\*

```bash

sudo apt install haproxy -y

```

### Step 5: Configure HAProxy

1. \*\*Edit HAProxy Configuration:\*\*

- Open the HAProxy configuration file:

```bash

sudo vi /etc/haproxy/haproxy.cfg

```

- Add the following configuration to set up load balancing:

```plaintext

frontend http\_front

bind \*:80

default\_backend http\_back

backend http\_back

balance roundrobin

server server1 <SERVER1\_IP>:<PORT> check

server server2 <SERVER2\_IP>:<PORT> check

server server3 <SERVER3\_IP>:<PORT> check

```

- Replace `<SERVER1\_IP>`, `<SERVER2\_IP>`, `<SERVER3\_IP>`, and `<PORT>` with the actual IP addresses and ports of the servers you want to load balance.

2. \*\*Enable and Start HAProxy:\*\*

```bash

sudo systemctl enable haproxy

sudo systemctl start haproxy

```

### Step 6: Verify HAProxy Configuration

1. \*\*Check HAProxy Status:\*\*

```bash

sudo systemctl status haproxy

```

2. \*\*Test Load Balancing:\*\*

- Access the HAProxy IP address in a web browser or use curl to test the load balancing:

```bash

curl http://<IP\_ADDRESS>

```

### Step 7: Cleanup

- Ensure that all configurations are saved and that the VM is functioning as expected.

- Document any issues encountered during the process and their resolutions.

## Conclusion

This MOP provides a comprehensive guide to deploying a VM on OpenStack, installing HAProxy, and configuring it for load balancing. Ensure to follow each step carefully and verify the configurations to achieve a successful deployment.