# Method of Procedure (MOP) for Installing a VM in OpenStack, Configuring nDPI, and Packet Inspection

## Document Control

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## Reference

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

- nDPI GitHub Repository: https://github.com/ntop/nDPI

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## Prerequisites

1. Access to an OpenStack environment with appropriate permissions to create and manage VMs.

2. Basic knowledge of OpenStack CLI or Horizon dashboard.

3. Familiarity with Linux command line.

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## Objective

This MOP outlines the steps to create a VM in OpenStack, assign an IP address, install nDPI, and configure it to inspect packets from a specific subnet.

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## Procedure

### Step 1: Create a VM in OpenStack

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

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

2. \*\*Create a VM:\*\*

- \*\*Using OpenStack CLI:\*\*

```bash

openstack server create --flavor <FLAVOR\_NAME> --image <IMAGE\_NAME> --network <NETWORK\_NAME> --key-name <KEY\_NAME> --security-group <SECURITY\_GROUP> <VM\_NAME>

```

Replace `<FLAVOR\_NAME>`, `<IMAGE\_NAME>`, `<NETWORK\_NAME>`, `<KEY\_NAME>`, `<SECURITY\_GROUP>`, and `<VM\_NAME>` with your specific values.

- \*\*Using Horizon Dashboard:\*\*

- Navigate to "Project" > "Compute" > "Instances".

- Click "Launch Instance".

- Fill in the required fields (Flavor, Image, Network, Key Pair, Security Group).

- Click "Launch Instance".

3. \*\*Assign an IP Address:\*\*

- \*\*Using OpenStack CLI:\*\*

```bash

openstack server add floating ip <VM\_NAME> <FLOATING\_IP>

```

Replace `<FLOATING\_IP>` with the desired IP address.

- \*\*Using Horizon Dashboard:\*\*

- Navigate to "Project" > "Compute" > "Instances".

- Select the created instance and click on "Associate Floating IP".

- Choose the desired floating IP and click "Associate".

### Step 2: Configure the VM

1. \*\*Access the VM:\*\*

- SSH into the VM using the assigned floating IP.

```bash

ssh -i <KEY\_PATH> <USERNAME>@<FLOATING\_IP>

```

2. \*\*Update the System:\*\*

```bash

sudo apt update && sudo apt upgrade -y

```

### Step 3: Install nDPI

1. \*\*Install Required Dependencies:\*\*

```bash

sudo apt install git cmake g++ libpcap-dev -y

```

2. \*\*Clone the nDPI Repository:\*\*

```bash

git clone https://github.com/ntop/nDPI.git

cd nDPI

```

3. \*\*Build and Install nDPI:\*\*

```bash

mkdir build

cd build

cmake ..

make

sudo make install

```

### Step 4: Configure nDPI for Packet Inspection

1. \*\*Identify the Subnet to Inspect:\*\*

- Determine the subnet you want to monitor (e.g., `192.168.1.0/24`).

2. \*\*Run nDPI to Inspect Packets:\*\*

- Use the following command to start inspecting packets on a specific interface (replace `<INTERFACE>` with your network interface name):

```bash

sudo ndpiReader -i <INTERFACE> -s 192.168.1.0/24

```

### Step 5: Configure CPU and RAM for the VM

1. \*\*Adjusting CPU and RAM:\*\*

- \*\*Using OpenStack CLI:\*\*

```bash

openstack server set --flavor <NEW\_FLAVOR\_NAME> <VM\_NAME>

```

Ensure that `<NEW\_FLAVOR\_NAME>` has the desired CPU and RAM specifications.

- \*\*Using Horizon Dashboard:\*\*

- Navigate to "Project" > "Compute" > "Instances".

- Select the instance and click on "Edit Instance".

- Change the flavor to one that meets your CPU and RAM requirements.

- Click "Save".

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## Verification

1. \*\*Check nDPI Installation:\*\*

- Run `ndpiReader --help` to verify that nDPI is installed correctly.

2. \*\*Monitor Packet Inspection:\*\*

- Ensure that nDPI is capturing packets from the specified subnet.

3. \*\*Check VM Resources:\*\*

- Use `htop` or `top` to verify CPU and RAM usage.

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## Troubleshooting

- If nDPI fails to capture packets, ensure that the correct network interface is specified and that you have the necessary permissions.

- If the VM does not start, check the OpenStack logs for errors related to resource allocation.

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## Conclusion

This MOP provides a comprehensive guide to creating a VM in OpenStack, installing nDPI, and configuring it for packet inspection. Follow the steps carefully to ensure a successful setup.