LAB 3- FAUCET

Prerequisites:

- VirtualBox 6.0
- A Host with a least this configuration:
- 8 GB of RAM
- 1 CPU
- 50 GB of storage available
- An internet connection

1. Quick Questions

1. What is Faucet?
2. What is Gauge?
3. What language use Faucet?
4. How many releases have Faucet?

2. Faucet all-in-one installation

2.1. Deploy the virtual machine

- Deploy a virtual machine:
  - Ubuntu 18.04 LTS
  - Hostname: faucet
  - 4GB RAM,
  - 2 vCPU
  - Disk of 30GB
  - 1 NAT card (for internet connection)
  - 1 Host-only card (for a private network)

You are free to use any method to deploy this machine. Or use the Vagrantfile provided below:

```
Vagrant.configure("2") do |config|
    config.vm.define "faucet" do |faucet|
        faucet.vm.box = "bento/ubuntu-18.04"
        faucet.vm.hostname= "faucet"
        faucet.vm.network "private_network", ip: "10.10.20.4"
        faucet.vm.provider "virtualbox" do |v|
            v.memory = 4096
            v.cpus = 2
            v.name = "faucet"
        end
    end
end
```

2.2. Install Faucet using package installation

- Add the faucet official repository to your system:

```
sudo apt-get install curl gnupg apt-transport-https lsb-release -y
echo "deb https://packagecloud.io/faucetsdn/faucet/$(lsb_release -
si | awk '{print tolower($0)}')/ $(lsb_release -
sc) main" | sudo tee /etc/apt/sources.list.d/faucet.list
curl -L https://packagecloud.io/faucetsdn/faucet/gpgkey | sudo apt-key add -
sudo apt-get update -y
```

- Install faucet. The command bellow will install faucet and install all the dependencies
  link to faucet.
  sudo apt-get install faucet-all-in-one -y

2.3. How to configure Faucet

As reminder Faucet use configuration file written in yaml.
The configuration file of Faucet is in **/etc/faucet/faucet.yaml**. You have to specify your topology
and VLAN information to Faucet in this file.

- Display the current file
- What are the main field? Describe those fields

The check_faucet_config command can be used to verify faucet has correctly interpreted your

configuration before loading it. It is recommended either running this command by hand or
with automation each time before loading configuration

- Use this command on the faucet.yaml file. What do you notice?
- Where can you find the faucet logs? (faucet.log)

2.4. How to configure Gauge

The Gauge configuration file is in the same path as the faucet configuration file.

- Display this file.
- What are the main field? Describe those fields
  In this lab we will not configure Gauge.

3. First Faucet use case

3.1. Open vSwitch installation

- Add WAND Open vSwitch repository
- Install open vSwitch
  sudo apt-get install openvswitch-switch

3.2. Creating a mini lab with shell function

You will use two Linux network namespaces to simulate hosts and this will allow you to
generate some traffic on your network.

- Execute those Bash functions

```
as_ns () {
    NAME=$1
    NETNS=faucet-${NAME}
    shift
    sudo ip netns exec ${NETNS} $@
}
```

```
create_ns () {
    NAME=$1
    IP=$2
    NETNS=faucet-${NAME}
    sudo ip netns add ${NETNS}
    sudo ip link add dev veth-${NAME} type veth peer name veth0 netns ${NETNS}
    sudo ip link set dev veth-${NAME} up
    as_ns ${NAME} ip link set dev lo up
    [ -n "${IP}" ] && as_ns ${NAME} ip addr add dev veth0 ${IP}
    as_ns ${NAME} ip link set dev veth0 up
}
```

- Create host1 and host2
  create_ns host1 10.20.0.1/24
  create_ns host2 10.20.0.2/24
- Configure Open vSwitch
  sudo ovs-vsctl add-br br0
  -- set bridge br0 other-config:datapath-id=0000000000000001
  -- set bridge br0 other-config:disable-in-band=true
  -- set bridge br0 fail_mode=secure
  -- add-port br0 veth-host1 -- set interface veth-host1 ofport_request=1
  -- add-port br0 veth-host2 -- set interface veth-host2 ofport_request=2
  -- set-controller br0 tcp:127.0.0.1:6653 tcp:127.0.0.1:6654
- You can now use the first function to ping host1 and host2
  as_ns host1 ping 10.20.0.2

Note: Open vSwitch is forwarding traffic under faucet control

- Find the log that is showing the forwarding of the traffic by faucet.

4. Monitoring

4.1. Prometheus

Faucet use Prometheus for the monitoring. It installs Prometheus during the installation of
Faucet.

- What monitoring is?
- What is Prometheus?
  The configuration file of Prometheus is in **/etc/default/Prometheus**
- Change the configuration file Prometheus loads by editing this file
  ARGS="--config.file=/etc/faucet/prometheus/prometheus.yml"
- Restart Prometheus to apply the changes
  sudo systemctl restart prometheus
- On which port can you access to Prometheus?
- Connect to the web interface of Prometheus on your web navigator
  **http://10.10.20.4:prometheusport

4.2. Grafana

During the installation of Faucet, it installs Grafana too. But it is not running yet.

- What is Grafana?
- Make Grafana start on boot
  sudo systemctl daemon-reload
  sudo systemctl enable grafana-server
- Start Grafana
  sudo systemctl start grafana-server
- Connect to the web interface of Grafana on your web navigator
  Note: The ID is admin and the password is admin

Grafana is not configured. You have to specify the data source. Here it is Prometheus.

- Then Import those following dashboard
  o
  https://docs.faucet.nz/en/latest/_static/grafanadashboards/faucet_instrumentation.json
  o
  https://docs.faucet.nz/en/latest/_static/grafanadashboards/faucet_i

nventory.json
o
https://docs.faucet.nz/en/latest/_static/grafanadashboards/faucet_port_statistics.json

4.3. Datapath

In the previous part you have connected your first switch (that we call a datapath) to faucet.

- Find the Datapath Inventory on Grafana
  Note: this datapath has been created on the previous part on Faucet use case.
- Create a second datapath

4.4. The Other Dashboard

You have import 3 dashboards in the part 4.2. You have seen 1 of the 3 in the previous part.

- Describe what are displaying the 2 other dashboards.