# Ubuntu VirtualBox VM Monitoring with Prometheus and Grafana

## **Overview**

This project demonstrates how to set up a virtual Ubuntu system using VirtualBox and monitor its performance using Prometheus and Grafana. It is intended for educational purposes related to understanding Linux system internals, virtualization, and basic observability tools.

# Requirements

- VirtualBox (6.x or later)
- Ubuntu 20.04 or 22.04 ISO
- Prometheus
- Node Exporter
- Grafana

# **Virtual Machine Setup**

- 1. Open VirtualBox and click "New".
- 2. Use the following settings:
  - Name: Ubuntu\_VM\_A3
  - Type: Linux
  - Version: Ubuntu (64-bit)
  - RAM: 2048 MBProcessor: 2 CPUs
  - Video Memory: 64 MB
  - Graphics Controller: VBoxVGA
- 3. Create a 25 GB virtual hard disk (VDI).
- 4. Mount the Ubuntu ISO in the Optical Drive.
- 5. Boot and install Ubuntu normally.

# **Post-Installation Configuration**

After Ubuntu installation, update the system:

sudo apt update && sudo apt upgrade -y sudo apt install wget curl net-tools -y

# **Installing Prometheus**

#### 1. Create a Prometheus user

sudo useradd --no-create-home --shell /bin/false prometheus

#### 2. Download and extract Prometheus

wget

https://github.com/prometheus/prometheus/releases/latest/download/prometheus-\*.tar.gz tar xvf prometheus-\*.tar.gz

## 3. Move binaries and config files

sudo mv prometheus-\* /etc/prometheus sudo mv /etc/prometheus/prometheus /usr/local/bin/

## 4. Create the systemd service file

Create the file /etc/systemd/system/prometheus.service:

#### [Unit]

Description=Prometheus Monitoring After=network.target

#### [Service]

**User=prometheus** 

ExecStart=/usr/local/bin/prometheus \

- --config.file=/etc/prometheus/prometheus.yml \
- --storage.tsdb.path=/var/lib/prometheus/ \
- --web.console.templates=/etc/prometheus/consoles \
- --web.console.libraries=/etc/prometheus/console\_libraries

Restart=always

#### [Install]

WantedBy=multi-user.target

#### 5. Enable and start Prometheus

sudo systemctl daemon-reexec sudo systemctl enable prometheus sudo systemctl start prometheus

Access Prometheus at: http://localhost:9090

# **Installing Node Exporter**

## 1. Download and run Node Exporter

```
wget
https://github.com/prometheus/node_exporter/releases/latest/download/node_exporter-*.
tar.gz
tar.xvf.node_exporter-*.tar.gz
cd.node_exporter-*/
./node_exporter
```

## 2. Add Node Exporter to Prometheus config

Edit /etc/prometheus/prometheus.yml:

```
scrape_configs:
- job_name: 'node'
static_configs:
- targets: ['localhost:9100']
```

**Restart Prometheus:** 

sudo systemctl restart prometheus

# **Installing Grafana**

sudo apt install -y software-properties-common sudo add-apt-repository "deb https://packages.grafana.com/oss/deb stable main" wget -q -O - https://packages.grafana.com/gpg.key | sudo apt-key add - sudo apt update sudo apt install grafana

Enable and start Grafana:

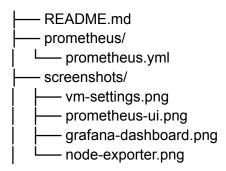
sudo systemctl enable grafana-server sudo systemctl start grafana-server

Access Grafana at: http://localhost:3000 Default login:

Username: adminPassword: admin

## **Folder Structure**

project/



# **Troubleshooting**

#### VirtualBox Guru Meditation

- Set graphics controller to VBoxVGA
- Increase video memory to at least 64 MB
- Disable EFI in VM settings → System → Motherboard

## **Prometheus Target Not Detected**

- Ensure localhost:9100 is listed in prometheus.yml
- Confirm Node Exporter is running on port 9100

## **Grafana Not Loading**

• Check Grafana status:

## sudo systemctl status grafana-server

• Confirm port 3000 is open and accessible

## References

- https://prometheus.io/docs/
- https://grafana.com/docs/
- https://github.com/prometheus/node\_exporter
- https://ubuntu.com/download

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