**Prometheus, Grafana & Node Exporter Setup**

**Monitoring in a Real-Time Scenario**

* **Prometheus**:
  + Continuously scrapes metrics from Node Exporter running on all VMs.
  + Can trigger alerts if performance thresholds are breached.
* **Grafana**:
  + Visualizes collected metrics on dashboards.
  + Example use case: Monitor Kafka's message rates, PostgreSQL's queries per second, and system health of all VMs.
* **Node Exporter**:
  + Collects VM metrics like CPU usage, memory, disk IO, and network stats.

**1.Install Prometheus**

1. Update the system:

sudo apt update && sudo apt upgrade -y

1. Add Prometheus to the system:

wget https://github.com/prometheus/prometheus/releases/download/v2.46.0/prometheus-2.46.0.linux-amd64.tar.gz

tar -xvf prometheus-2.46.0.linux-amd64.tar.gz

sudo mv prometheus-2.46.0.linux-amd64 /opt/prometheus

1. Configure Prometheus:
   * Edit the configuration file:

nano /opt/prometheus/prometheus.yml

* + Add monitoring targets (your project VMs):

scrape\_configs:

- job\_name: "node\_exporter"

static\_configs:

- targets: ["<VM1-IP>:9100", "<VM2-IP>:9100"]

1. Set up Prometheus as a service:

sudo nano /etc/systemd/system/prometheus.service

Add the following:

[Unit]

Description=Prometheus Monitoring

After=network.target

[Service]

User=root

ExecStart=/opt/prometheus/prometheus --config.file=/opt/prometheus/prometheus.yml

[Install]

WantedBy=multi-user.target

1. Enable and start Prometheus:

sudo systemctl daemon-reload

sudo systemctl enable prometheus

sudo systemctl start prometheus

**3. Install Node Exporter**

On each VM (including VM5):

1. Download Node Exporter:

wget https://github.com/prometheus/node\_exporter/releases/download/v1.6.1/node\_exporter-1.6.1.linux-amd64.tar.gz

tar -xvf node\_exporter-1.6.1.linux-amd64.tar.gz

sudo mv node\_exporter-1.6.1.linux-amd64 /opt/node\_exporter

1. Create a service file:

sudo nano /etc/systemd/system/node\_exporter.service

Add:

[Unit]

Description=Node Exporter

After=network.target

[Service]

User=root

ExecStart=/opt/node\_exporter/node\_exporter

[Install]

WantedBy=multi-user.target

1. Enable and start Node Exporter:

sudo systemctl daemon-reload

sudo systemctl enable node\_exporter

sudo systemctl start node\_exporter

**4. Install Grafana**

1. Add Grafana repository:

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 -

1. Install Grafana:

sudo apt update

sudo apt install grafana -y

1. Enable and start Grafana:

sudo systemctl enable grafana-server

sudo systemctl start grafana-server

**5. Configure Grafana**

1. Access Grafana UI at http://<VM5-IP>:3000 and log in (default credentials: admin/admin).
2. Add Prometheus as a data source:
   * Go to **Configuration > Data Sources**.
   * Add a new Prometheus data source with URL http://<VM5-IP>:9090.
3. Import dashboards:
   * Use existing templates for system monitoring or Kafka/PostgreSQL dashboards.