**Setup Grafana, Prometheus and Node exporter.**

**Step 1: Create a Dedicated Prometheus User**

To enhance security and streamline administration, it’s best to create a dedicated user for Prometheus. This user will serve as a system account for the service. Run the following command:

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

--system: Creates a system account.  
--no-create-home: We don't need a home directory for Prometheus.  
--shell /bin/false: Prevents logging in as a Prometheus user.

**Step 2: Download and Extract Prometheus**

Let’s fetch the latest version of [Prometheus](https://prometheus.io/download/) from the official [download](https://prometheus.io/download/) page using wget:

wget https://github.com/prometheus/prometheus/releases/download/v2.45.0/prometheus-2.45.0.linux-amd64.tar.gz

Now, extract the Prometheus files:

tar -xvf prometheus-2.45.0.linux-amd64.tar.gz

**Step 3: Create Directories for Prometheus**

Create the necessary directories for Prometheus and its configuration files:

sudo mkdir -p /data /etc/prometheus

Navigate to the Prometheus directory:

cd prometheus-2.32.1.linux-amd64

Move Prometheus and promtool binaries to /usr/local/bin/:

sudo mv prometheus promtool /usr/local/bin/

Optionally, move console libraries to the Prometheus configuration directory:

sudo mv consoles/ console\_libraries/ /etc/prometheus/

Lastly, move the example Prometheus configuration file:

sudo mv prometheus.yml /etc/prometheus/prometheus.yml

**Step 5: Set Correct Ownership**

Ensure the correct ownership for /etc/prometheus/ and /data/ directories:

sudo chown -R prometheus:prometheus /etc/prometheus/ /data/

**Step 6: Verify Prometheus Installation**

Check if Prometheus is installed correctly by running:

prometheus --version

For more information and configuration options, use the prometheus --help command.

**Step 7: Configure Prometheus as a systemd Service**

To manage Prometheus using systemd, create a systemd unit configuration file:

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

Add the following content to the file:

[Unit]  
Description=Prometheus  
Wants=network-online.target  
After=network-online.target  
  
StartLimitIntervalSec=500  
StartLimitBurst=5  
  
[Service]  
User=prometheus  
Group=prometheus  
Type=simple  
Restart=on-failure  
RestartSec=5s  
ExecStart=/usr/local/bin/prometheus \  
 --config.file=/etc/prometheus/prometheus.yml \  
 --storage.tsdb.path=/data \

--storage.tsdb.retention.time=365d \  
 --web.console.templates=/etc/prometheus/consoles \  
 --web.console.libraries=/etc/prometheus/console\_libraries \  
 --web.listen-address=0.0.0.0:9090 \  
 --web.enable-lifecycle  
  
[Install]  
WantedBy=multi-user.target

Key options to note in the systemd unit file:

* User and Group: Specify the Linux user and group for Prometheus.
* --config.file: Path to the main Prometheus configuration file.
* --storage.tsdb.path: Location to store Prometheus data.
* --web.listen-address: Configured to listen on all network interfaces.
* --web.enable-lifecycle: Allows managing Prometheus without restarting.

**Step 8: Enable and Start Prometheus**

Enable Prometheus to start on boot:

sudo systemctl enable prometheus

Start Prometheus:

sudo systemctl start prometheus

Check the status of Prometheus:

sudo systemctl status prometheus

**Step 9: Access Prometheus Web Interface**

Access the Prometheus web interface by opening your browser and navigating to your EC2 instance’s public IP address on port **9090** (e.g., [**http://your-instance-ip:9090**).](http://your-instance-ip:9090)./)

A screenshot of a computer

Description automatically generated

**Step 10: Install and Configure Node Exporter**

Next, we will set up Node Exporter to collect system metrics from your EC2 instance. Node Exporter exposes these metrics in Prometheus format.

**Step 11: Create a System User for Node Exporter**

Create a system user for Node Exporter with the following command:

sudo useradd --system --no-create-home --shell /bin/false node\_exporter

**Step 12:**[**Download**](https://prometheus.io/download/)**and Install Node Exporter**

[Download Node Exporter](https://prometheus.io/download/):

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

Extract Node Exporter:

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

Move the Node Exporter binary to /usr/local/bin/:

sudo mv node\_exporter-1.6.1.linux-amd64/node\_exporter /usr/local/bin/

**Step 13: Create a systemd Service for Node Exporter**

Create a systemd unit configuration file for Node Exporter:

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

Add the following content to the file:

**Step 14: Enable and Start Node Exporter**

[Unit]   
Description=Node Exporter   
Wants=network-online.target   
After=network-online.target  
StartLimitIntervalSec=500   
StartLimitBurst=5

[Service]   
User=node\_exporter   
Group=node\_exporter   
Type=simple   
Restart=on-failure   
RestartSec=5s   
ExecStart=/usr/local/bin/node\_exporter \  
    --collector.logind

[Install]   
WantedBy=multi-user.target

Enable Node Exporter to start on boot:

sudo systemctl enable node\_exporter

**Start Node Exporter:**

sudo systemctl start node\_exporter

Check the status of Node Exporter:

sudo systemctl status node\_exporter

**Step 15: Add Node Exporter as a Target in Prometheus**

sudo vim /etc/prometheus/prometheus.yml

Add the following job configuration for Node Exporter:

- job\_name: 'node\_export'  
 static\_configs:  
 - targets: ["localhost:9100"]

*This configuration tells Prometheus to scrape metrics from Node Exporter, which runs on port****9100****by default.*

**Step 16: Reload Prometheus Configuration**

Before reloading the configuration, validate it:

promtool check config /etc/prometheus/prometheus.yml

Reload Prometheus configuration without restarting the service:

curl -X POST http://localhost:9090/-/reload

**Step 17: Install Grafana for Visualization**

**Grafana is a powerful visualization tool that works seamlessly with Prometheus. Install Grafana by following these steps:**

* Ensure dependencies are installed:

sudo apt-get install -y apt-transport-https software-properties-common

* Add the Grafana GPG key:

wget -q -O - https://packages.grafana.com/gpg.key | sudo apt-key add -

* Add the Grafana repository for stable releases:

echo "deb https://packages.grafana.com/oss/deb stable main" | sudo tee -a /etc/apt/sources.list.d/grafana.list

* Update and install Grafana:

sudo apt-get update  
sudo apt-get -y install grafana

Step 18: Enable and Start Grafana

Enable Grafana to start on boot:

sudo systemctl enable grafana-server

Start Grafana:

sudo systemctl start grafana-server

Check the status of Grafana:

sudo systemctl status grafana-server

**Step 19: Access Grafana Web Interface**

Access the Grafana web interface by opening your browser and navigating to your **EC2 instance’s public IP address** on port **3000** (e.g., http://your-instance-ip:3000). Log in using the default credentials (**username: admin, password: admin**).

**Step 20: Customize Grafana Settings**

* After your initial login to Grafana, you will have the opportunity to change your password. Let’s set the new password to “***newpassword@123***”

**Step 21: Add Prometheus Data Source**

* To visualize metrics, you need to add a data source in Grafana. Follow these steps:
* Click on the gear icon (⚙️) in the left sidebar to access the Configuration menu.
* Select “Data Sources” and click “Add data source.”
* Choose “Prometheus” as the data source type.
* In the URL field, enter http://localhost:9090 and click "Save & Test." You should see a message indicating that the data source is working correctly.

**Step 22: Provision Data Source as Code**

* In production environments, it’s common to store configurations in version control systems like Git. To add the data source as code, let’s remove the data source we added through the UI:
* Go back to the “Data Sources” page in Grafana.
* Delete the Prometheus data source.

**Step 23: Create a Datasources Configuration File**

* Create a new datasources.yaml file for provisioning the data source as code:

sudo vim /etc/grafana/provisioning/datasources/datasources.yaml

* Add the following content to the datasources.yaml file:

apiVersion: 1  
datasources:  
 - name: Prometheus  
 type: prometheus  
 url: http://localhost:9090  
 isDefault: true

* Optionally, you can set this data source as the default one.

**Step 24: Restart Grafana to Apply Configuration Changes**

* Restart Grafana to apply the new configuration:

sudo systemctl restart grafana-server

* Go back to the Grafana web interface and refresh the page. You should now see the Prometheus data source listed.