How To Install Prometheus on Ubuntu

First, you will need to install Prometheus. Begin by logging into your server and updating the package lists as follows:

```
sudo apt update
```

Next, you'll create the configuration and data directories for Prometheus. To create a configuration directory called `prometheus`, run the following command:

```
sudo mkdir -p /etc/prometheus
```

Next, create the data directories:

```
sudo mkdir -p /var/lib/prometheus
```

After creating the directories, you'll download the compressed installation file. Prometheus installation files come in precompiled binaries in compressed files. To download Prometheus, visit the download page.

To download version `2.31.0`, run the following command, replacing the version number as needed:

```
wget
https://github.com/prometheus/prometheus/releases/download/v2.31.0/prometh
eus-2.31.0.linux-amd64.tar.gz
```

Once downloaded, extract the tarball file:

```
tar -xvf prometheus-2.31.0.linux-amd64.tar.gz
```

After extracting the file, navigate to the Prometheus folder:

```
cd prometheus-2.31.0.linux-amd64
```

Then, move the `prometheus` and `promtool` binary files to the `/usr/local/bin/` directory:

```
sudo mv prometheus promtool /usr/local/bin/
```

Next, you'll move all the files related to Prometheus to one location: `/etc/prometheus/`. To move the console files in the `consoles` directory and the library files in the `console_libraries` directory, run the following command:

```
sudo mv consoles/ console_libraries/ /etc/prometheus/
```

The console and console library files are used to launch the Prometheus GUI. These files will be kept with the configuration files so that they can be used while starting the service.

Finally, move the `prometheus.yml` template configuration file to the `/etc/prometheus/` directory:

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

`prometheus.yml` is the template configuration file where you will configure the port for Prometheus and which files to use while starting the service.

To check the version of Prometheus installed, run the command:

```
prometheus --version
```

You'll receive output similar to this:

```
Output:

prometheus, version 2.31.0 (branch: HEAD, revision:
b41e0750abf5cc18d8233161560731de05199330)
  build user:         root@0aa1b7fc430d
  build date:         20220714-15:13:18
  go version:         go1.18.4
  platform:           linux/amd64
```

In this section, you installed Prometheus and verified its version. Next, you'll start it as a service.

Running Prometheus as a Service

Now that you have installed Prometheus, you'll configure it to run as a service.

Before creating the system file to accomplish this, you'll need to create a Prometheus group and user. You'll need a dedicated user with owner access to the necessary directories. To create a `prometheus` group, run the following command:

```
sudo groupadd --system prometheus
```

Next, create a `prometheus` user and assign it to the `prometheus` group you just created:

```
sudo useradd -s /sbin/nologin --system -g prometheus prometheus
```

Change the directory ownership and permissions as follows so that the dedicated user has the correct permissions:

```
sudo chown -R prometheus:prometheus /etc/prometheus/ /var/lib/prometheus/
```

```
sudo chmod -R 775 /etc/prometheus/ /var/lib/prometheus/
```

Next, you'll create the service file to run Prometheus as a service. Using `nano` or your favorite text editor, create a `systemd` service file called `prometheus.service`:

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

Add the following lines of code:

/etc/systemd/system/prometheus.service

```
[Unit]
Description=Prometheus
Wants=network-online.target
```

```
After=network-online.target

[Service]
User=prometheus
Group=prometheus
Restart=always
Type=simple
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 \
    --web.listen-address=0.0.0.0:9090

[Install]
WantedBy=multi-user.target
```

With this code, you configure Prometheus to use the files listed in the `ExecStart` block to run the service. The service file tells `systemd` to run Prometheus as the `prometheus` user with the configuration file `/etc/prometheus/prometheus.yml` and to store its data in the `/var/lib/prometheus` directory. You also configure Prometheus to run on port `9090`.

Save and close your file. If using `nano`, press `CTRL+X` and then `Y`.

Now, start the Prometheus service:

```
sudo systemctl start prometheus
```

Enable the Prometheus service to run at startup:

```
sudo systemctl enable prometheus
```

You can check the service status using following command:

```
sudo systemctl status prometheus
```

The output will confirm that the service is `active (running)`:

```
Output
● prometheus.service - Prometheus
```

```
     Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; vendor
preset: enabled)
     Active: active (running) since Fri 2022-08-05 18:06:05 UTC; 13s ago
   Main PID: 7177 (prometheus)
      Tasks: 6 (limit: 527)
     Memory: 21.0M
     CGroup: /system.slice/prometheus.service
             └─7177 /usr/local/bin/prometheus
--config.file=/etc/prometheus/prometheus.yml
--storage.tsdb.path=/var/lib/prometheus/ --web.console.template>
```

To access Prometheus, launch your browser and visit your server's IP address followed by port `9090`: `http://your_server_ip:9090`.

Installing MongoDb Community Edition

1. From a terminal, install `gnupg` and `curl` if they are not already available:

```
sudo apt-get install gnupg curl
```

To import the MongoDB public GPG key, run the following command:

```
     curl -fsSL https://www.mongodb.org/static/pgp/server-8.0.asc | \
     sudo gpg -o /usr/share/keyrings/mongodb-server-8.0.gpg \
     --dearmor
```

2. Create the list file `/etc/apt/sources.list.d/mongodb-org-8.0.list` for your version of Ubuntu.
Create the list file for Ubuntu 22.04:

```
echo "deb [ arch=amd64,arm64 signed-by=/usr/share/keyrings/mongodb-server-8.0.gpg
] https://repo.mongodb.org/apt/ubuntu jammy/mongodb-org/8.0 multiverse" | sudo tee
/etc/apt/sources.list.d/mongodb-org-8.0.list
```

3. Reload the Package Database:

```
 sudo apt-get update
```

4.Install MongoDB Community Server:

```
sudo apt-get install -y mongodb-org
```

5. Now you Start and Enable the MongoDB service:

```
 sudo systemctl start mongod
sudo  systemctl daemon-reload
sudo systemctl enable mongod
```

6. Verify that MongoDB has started successfully.

```
 sudo systemctl status mongod
```

Installing The MongoDB exporter

In this section, you will install the MongoDB exporter. First, create a directory for the exporter and navigate to it:

```
mkdir mongodb-exporter
cd mongodb-exporter
```

The MongoDB exporter can be downloaded from Github. The exporter comes as a binary file in an archive, but you will configure it as a service. Download the binary file with the following command:

```
wget
https://github.com/percona/mongodb_exporter/releases/download/v0.7.1/mongo
db_exporter-0.7.1.linux-amd64.tar.gz
```

Next, extract the downloaded archive into your current folder:

```
tar xvzf mongodb_exporter-0.7.1.linux-amd64.tar.gz
```

Finally, move the `mongodb_exporter` binary to `usr/local/bin/`:

```
sudo mv mongodb_exporter /usr/local/bin/
```

In this section, you installed the MongoDB exporter. Next, you will enable MongoDB authentication and create a user for monitoring.

Enabling MongoDB Authentication

In this section, you will set up MongoDB authentication for the MongoDB exporter and create a user to monitor the cluster's metrics.

Begin by connecting to your MongoDB instance with `mongo`:

```
mongosh
```

You will create an administrator account for your exporter with the cluster monitor role. Switch to the `admin` database:

```
use admin
```

After switching to the `admin` database, create a user with the `clusterMonitor` role:

```
db.createUser({user: "test",pwd: "testing",roles: [{ role:
"clusterMonitor", db: "admin" },{ role: "read", db: "local" }]})
```

You'll receive the following output:

```
Successfully added user: {
        "user" : "test",
        "roles" : [
                {
                        "role" : "clusterMonitor",
                        "db" : "admin"
                },
                {
                        "role" : "read",
                        "db" : "local"
                }
```

```
          ]
}
```

After creating the user, exit the MongoDB shell:

```
exit
```

Next, set your MongoDB URI environment variable with the appropriate authentication credentials:

```
export MONGODB_URI=mongodb://test:testing@localhost:27017
```

You set the `MONGODB_URI` to specify the `mongodb` instance that uses the authentication credentials you set earlier (the `test` user and `testing` password). `27017` is the default port for a `mongodb` instance. When you set the environment variable, it takes precedence over the profile stored in the configuration file.

To check that the MongoDO URI environment variable was set correctly, run the following command:

```
env | grep mongodb
```

You'll receive the following output:

```
MONGODB_URI=mongodb://mongodb_exporter:password@localhost:27017
```

In this section, you created a MongoDB user with the `clusterMonitor` role, which helps to monitor the cluster metrics. Next, you'll configure the MongoDB exporter to run as a service.

Creating a service for the MongoDB Exporter

In this section, you will create a system file for the MongoDB exporter and run it as a service.

Navigate to `/lib/systemd/system` and create a new service file for the exporter using `nano` or your favorite text editor:

```
cd /lib/systemd/system/
sudo nano mongodb_exporter.service
```

Paste the following configuration into your service file:

/lib/systemd/system/mongodb_exporter.service

```
[Unit]
Description=MongoDB Exporter
User=prometheus

[Service]
Type=simple
Restart=always
ExecStart=/usr/local/bin/mongodb_exporter

[Install]
WantedBy=multi-user.target
```

This service file tells `systemd` to run MongoDB exporter as a service under the `prometheus` user. `ExecStart` will run the `mongodb_exporter` binary from `usr/local/bin/`. .

Save and close your file.

Next, restart your system daemon to reload the unit files:

```
sudo systemctl daemon-reload
```

Now, start your service:

```
sudo systemctl start mongodb_exporter.service
```

To check the status of the MongoDB exporter service, run the following command:

```
sudo systemctl status mongodb_exporter.service
```

The output will confirm that the service is `active (running)`:

```
Output
● mongodb_exporter.service - MongoDB Exporter
     Loaded: loaded (/lib/systemd/system/mongodb_exporter.service; disabled;
vendor preset: enabled)
     Active: active (running) since Fri 2022-08-05 18:18:38 UTC; 1 weeks 3 days
ago
   Main PID: 7352 (mongodb_exporte)
      Tasks: 5 (limit: 527)
     Memory: 14.2M
     CGroup: /system.slice/mongodb_exporter.service
             └─7352 /usr/local/bin/mongodb_exporter
```

To ensure that everything is working as expected, navigate to the project root and run a curl command on port `9216`, which is where the exporter runs:

```
cd ~
sudo curl http://localhost:9216/metrics
```

The output will be long, and will contain lines similar to this:

```
Output

# HELP go_gc_duration_seconds A summary of the GC invocation durations.
# TYPE go_gc_duration_seconds summary
go_gc_duration_seconds{quantile="0"} 0
go_gc_duration_seconds{quantile="0.25"} 0
go_gc_duration_seconds{quantile="0.5"} 0
go_gc_duration_seconds{quantile="0.75"} 0
go_gc_duration_seconds{quantile="1"} 0
go_gc_duration_seconds_sum 0
go_gc_duration_seconds_count 0
# HELP go_goroutines Number of goroutines that currently exist.
# TYPE go_goroutines gauge
go_goroutines 11
# HELP go_memstats_alloc_bytes Number of bytes allocated and still in use.
# TYPE go_memstats_alloc_bytes gauge
go_memstats_alloc_bytes 1.253696e+06
# HELP go_memstats_alloc_bytes_total Total number of bytes allocated, even if
freed.
# TYPE go_memstats_alloc_bytes_total counter
go_memstats_alloc_bytes_total 1.253696e+06
# HELP go_memstats_buck_hash_sys_bytes Number of bytes used by the profiling
bucket hash table.
# TYPE go_memstats_buck_hash_sys_bytes gauge
go_memstats_buck_hash_sys_bytes 3054
# HELP go_memstats_frees_total Total number of frees.
# TYPE go_memstats_frees_total counter
go_memstats_frees_total 2866
# HELP go_memstats_gc_sys_byte
.
.
.
# HELP mongodb_asserts_total The asserts document reports the number of asserts
on the database. While assert errors are typically uncommon, if there are
non-zero values for the asserts, you should check the log file for the mongod
process for more information. In many cases these errors are trivial, but are
worth investigating.
# TYPE mongodb_asserts_total counter
mongodb_asserts_total{type="msg"} 0
mongodb_asserts_total{type="regular"} 0
mongodb_asserts_total{type="rollovers"} 0
mongodb_asserts_total{type="user"} 19
mongodb_asserts_total{type="warning"} 0
# HELP mongodb_connections The connections sub document data regarding the
current status of incoming connections and availability of the database server.
Use these values to assess the current load and capacity requirements of the
server
# TYPE mongodb_connections gauge
mongodb_connections{state="available"} 51198
mongodb_connections{state="current"} 2
# HELP mongodb_connections_metrics_created_total totalCreated provides a count
of all incoming connections created to the server. This number includes
connections that have since closed
# TYPE mongodb_connections_metrics_created_total counter
mongodb_connections_metrics_created_total 6
# HELP mongodb_exporter_build_info A metric with a constant '1' value labeled
by version, revision, branch, and goversion from which mongodb_exporter was
built.
# TYPE mongodb_exporter_build_info gauge
mongodb_exporter_build_info{branch="v0.7.1",goversion="go1.11.10",revision="300
2738d50f689c8204f70f6cceb8150b98fa869",version="0.7.1"} 1
# HELP mongodb_exporter_last_scrape_duration_seconds Duration of the last
scrape of metrics from MongoDB.
# TYPE mongodb_exporter_last_scrape_duration_seconds gauge
mongodb_exporter_last_scrape_duration_seconds 0.003641888
# HELP mongodb_exporter_last_scrape_error Whether the last scrape of metrics
from MongoDB resulted in an error (1 for error, 0 for success).
```

```
# TYPE mongodb_exporter_last_scrape_error gauge
mongodb_exporter_last_scrape_error 0
.
.
.
...
```

The output confirms that the MongoDB exporter is collecting metrics, such as the `mongodb` version, `metrics-document`, and the connections details.

In this section, you set up the MongoDB exporter as a service and collected metrics from MongoDB. Next, you will configure the exporter as a target for Prometheus.

Configure the MongoDB Exporter as a Prometheus Target

In this section, you will configure the MongoDB exporter as a Prometheus target. Navigate to the directory holding your Prometheus configuration file:

```
cd /etc/prometheus/
```

Using `nano` or your favorite text editor, open the file for editing:

```
sudo nano prometheus.yml
```

Add the MongoDB exporter as a target by copying the highlighted lines into your file:

```
# A scrape configuration containing exactly one endpoint to scrape:
# Here it's Prometheus itself.
scrape_configs:
  # The job name is added as a label `job=<job_name>` to any timeseries scraped
from this config.
  - job_name: "prometheus"
    static_configs:
            - targets: ["localhost:9090", "localhost:9216"]
```

`9216` is the default port for the MongoDB exporter.

Save and close your file.

After adding the target, restart Prometheus:

```
sudo systemctl restart prometheus
```

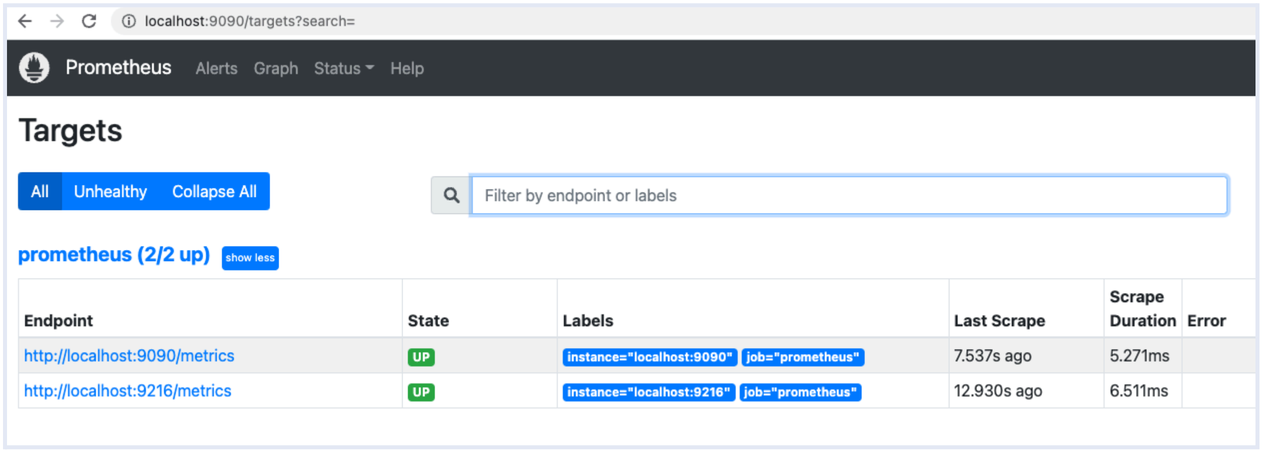
Navigate to `http://localhost:9090/targets` to verify that Prometheus is scraping your newly added exporter.

Note: If you are using a remote server, you can view the targets by navigating to `http://your_server_ip:9090/targets`. You could also use port-forwarding to view the targets locally. To do this, open a new terminal on your local computer and enter the following command:

```
ssh -i "Rsa-key.pem" -L 9090:localhost:9090  your_non_root_user@your_server_ip
```

Upon connecting to the server, navigate to `http://localhost:9090/targets` on your local machine's web browser.

You will access a list of Prometheus targets:



Targets

prometheus (2/2 up)

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://localhost:9090/metrics	UP	instance="localhost:9090" job="prometheus"	7.537s ago	5.271ms	
http://localhost:9216/metrics	UP	instance="localhost:9216" job="prometheus"	12.930s ago	6.511ms	

The `9090` endpoint is Prometheus scraping itself. The `9216` endpoint is the MongoDB exporter, which confirms your configuration is working as expected.

In this step, you installed the MongoDB exporter and configured it as a Prometheus target to collect metrics. Next, you will create a MongoDB dashboard in the Grafana web console to view and analyze these metrics.

How To Install Grafana on Ubuntu

In this first step, you will install Grafana onto your Ubuntu 20.04 server. You can install Grafana either by downloading it directly from its official website or by going through an APT repository. Because an APT repository makes it easier to install and manage Grafana's updates, you'll use that method in this tutorial.

Download the Grafana GPG key with `wget`, then pipe the output to `apt-key`. This will add the key to your APT installation's list of trusted keys, which will allow you to download and verify the GPG-signed Grafana package:

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

In this command, the option `-q` turns off the status update message for `wget`, and `-O` outputs the file that you downloaded to the terminal. These two options ensure that only the contents of the downloaded file are pipelined to `apt-key`.

Next, add the Grafana repository to your APT sources:

```
sudo add-apt-repository "deb https://packages.grafana.com/oss/deb stable
main"
```

Refresh your APT cache to update your package lists:

```
sudo apt update
```

You can now proceed with the installation:

```
sudo apt install grafana
```

Once Grafana is installed, use `systemctl` to start the Grafana server:

```
sudo systemctl start grafana-server
```

Next, verify that Grafana is running by checking the service's status:

```
sudo systemctl status grafana-server
```

You will receive output similar to this:

```
Output

● grafana-server.service - Grafana instance

     Loaded: loaded (/lib/systemd/system/grafana-server.service; disabled;
vendor preset: enabled)

   Active: active (running) since Thu 2020-05-21 08:08:10 UTC; 4s ago

     Docs: http://docs.grafana.org

 Main PID: 15982 (grafana-server)

    Tasks: 7 (limit: 1137)

...
```

This output contains information about Grafana's process, including its status, Main Process Identifier (PID), and more. `active (running)` shows that the process is running correctly.

Lastly, enable the service to automatically start Grafana on boot:

```
sudo systemctl enable grafana-server
```

You will receive the following output:

```
Output
```

```
Synchronizing state of grafana-server.service with SysV service script with
/lib/systemd/systemd-sysv-install.

Executing: /lib/systemd/systemd-sysv-install enable grafana-server

Created symlink
/etc/systemd/system/multi-user.target.wants/grafana-server.service →
/usr/lib/systemd/system/grafana-server.service.
```

This confirms that `systemd` has created the necessary symbolic links to autostart Grafana.

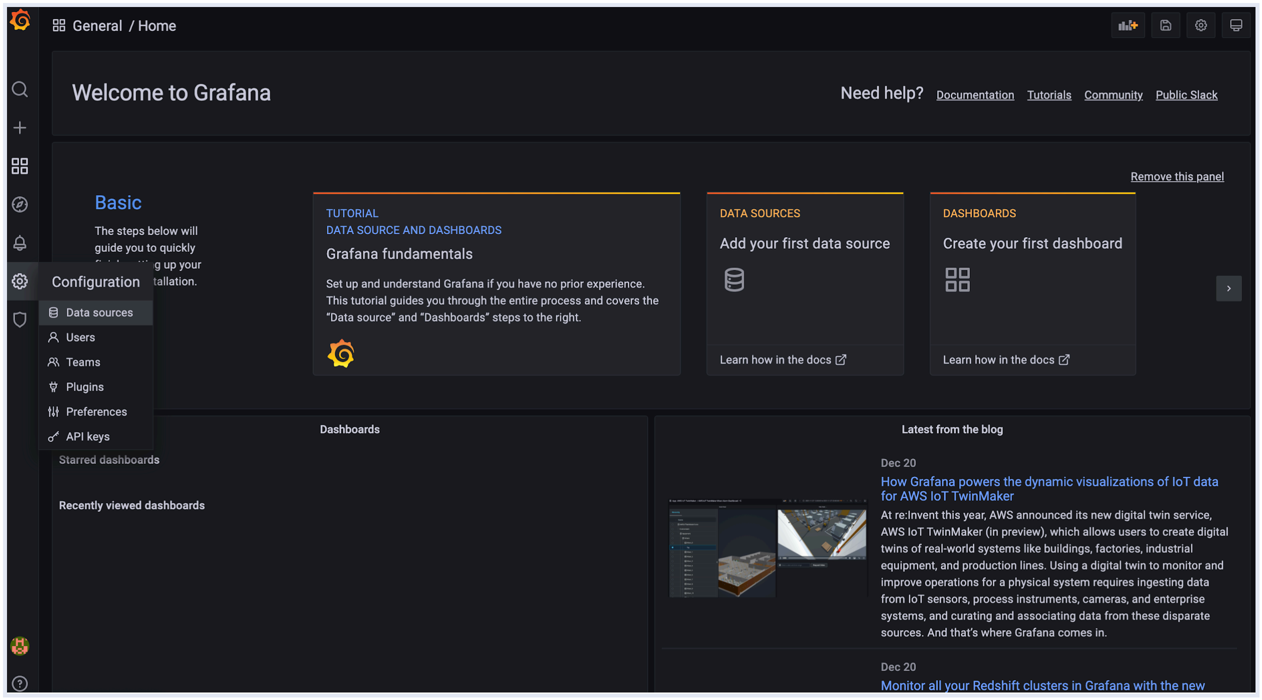
Grafana is now installed and ready for use

Building A Dashboard in Grafana

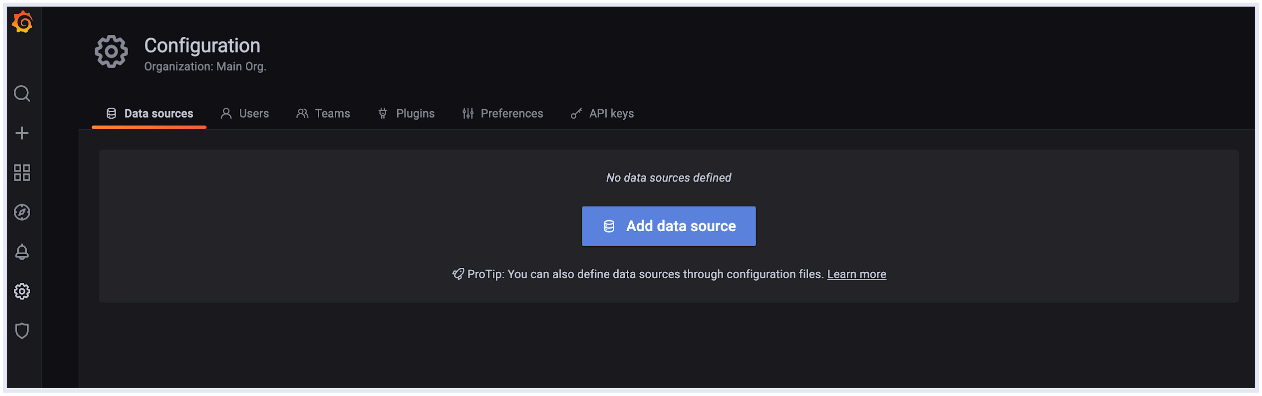
In this step, you will build a dashboard to visualize your MongoDB data in Grafana. To accomplish this, you will add Prometheus as a data source in Grafana and import a MongoDB dashboard from Percona..In this, you will import the MongoDB Overview dashboard into your Grafana instance. To begin, you'll set Prometheus as a Grafana data source.

Navigate to your Grafana instance at `your_domain:3000` and log in using the credentials(for admin : username and password both is admin) you created during the prerequisites.

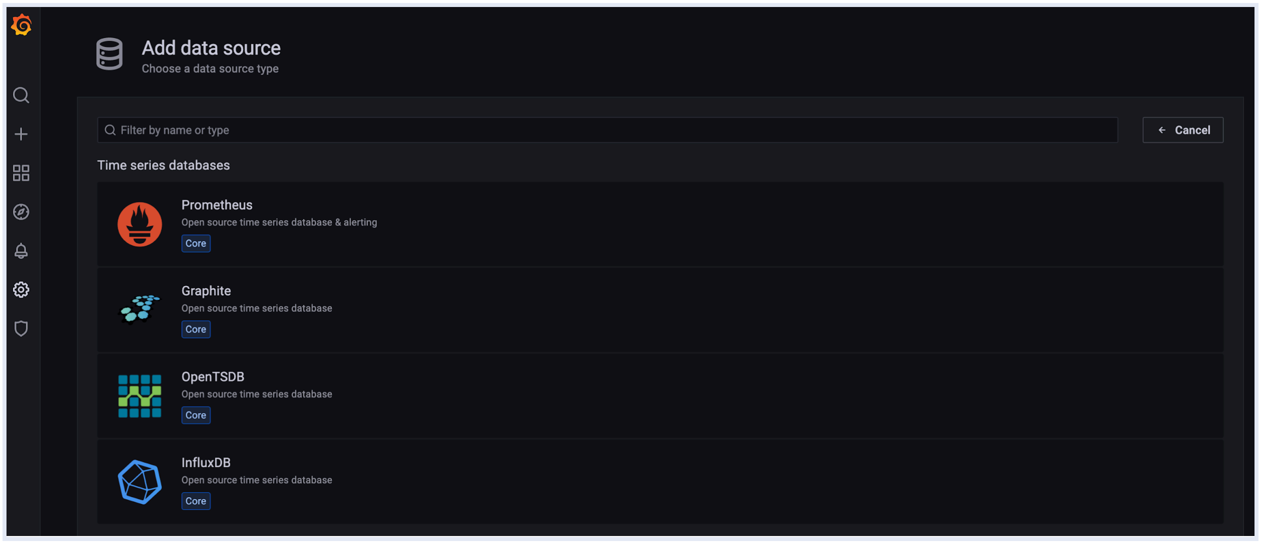
In the left panel, click the gear icon for Configuration, then select Data Sources:


General / Home
Welcome to Grafana
Need help? Documentation Tutorials Community Public Slack
Remove this panel
Basic
The steps below will guide you to quickly finish setting up your installation.
Configuration
Data sources
Users
Teams
Plugins
Preferences
API keys
TUTORIAL
DATA SOURCE AND DASHBOARDS
Grafana fundamentals
Set up and understand Grafana if you have no prior experience. This tutorial guides you through the entire process and covers the "Data source" and "Dashboards" steps to the right.
DATA SOURCES
Add your first data source
Learn how in the docs
DASHBOARDS
Create your first dashboard
Learn how in the docs
Dashboards
Starred dashboards
Recently viewed dashboards
Latest from the blog
Dec 20
How Grafana powers the dynamic visualizations of IoT data for AWS IoT TwinMaker
At re:Invent this year, AWS announced its new digital twin service, AWS IoT TwinMaker (in preview), which allows users to create digital twins of real-world systems like buildings, factories, industrial equipment, and production lines. Using a digital twin to monitor and improve operations for a physical system requires ingesting data from IoT sensors, process instruments, cameras, and enterprise systems, and curating and associating data from these disparate sources. And that's where Grafana comes in.
Dec 20
Monitor all your Redshift clusters in Grafana with the new

Click on Add data source:



Then select Prometheus:


Add data source

Choose a data source type

Filter by name or type

Cancel

Time series databases

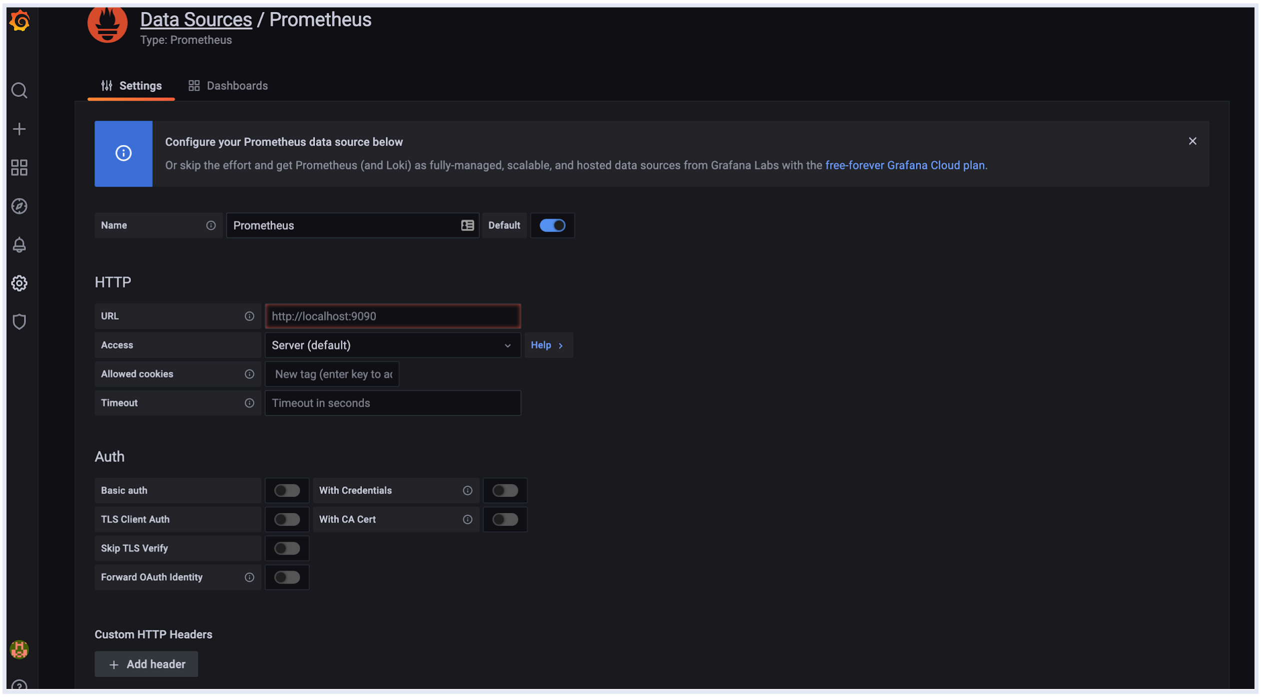
Prometheus
Open source time series database & alerting
Core

Graphite
Open source time series database
Core

OpenTSDB
Open source time series database
Core

InfluxDB
Open source time series database
Core

On the next screen, you'll configure the Settings for your Prometheus data source:


Data Sources / Prometheus

Type: Prometheus

Settings | Dashboards

Configure your Prometheus data source below

Or skip the effort and get Prometheus (and Loki) as fully-managed, scalable, and hosted data sources from Grafana Labs with the free-forever Grafana Cloud plan.

Name	Prometheus	Default	On

HTTP

URL	http://localhost:9090
Access	Server (default)
Allowed cookies	New tag (enter key to ac
Timeout	Timeout in seconds

Auth

Basic auth	Off	With Credentials	Off
TLS Client Auth	Off	With CA Cert	Off
Skip TLS Verify	Off		
Forward OAuth Identity	Off		

Custom HTTP Headers

Add header

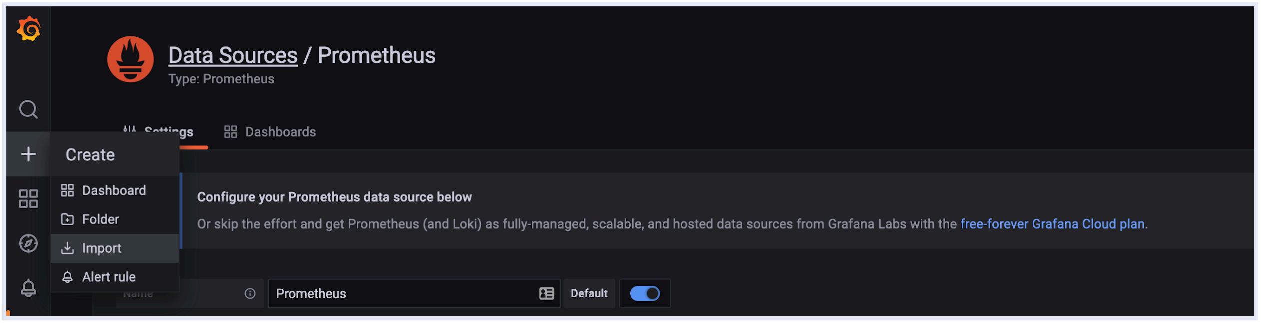
In the URL field, provide the URL for your Prometheus instance:

```
http://your_server_ip:9090/
```

Click on Save & test at the bottom of the screen. Now Prometheus is added as a data source for Grafana.

Next, you will import the MongoDB Overview dashboard for Grafana. You can import the dashboard by uploading a JSON file or by importing a dashboard ID, which you can find in the Grafana product documents for dashboards. Here, you will use the dashboard ID to import the dashboard.

On the left menu, click the plus icon for Create and select Import. From there, you should be taken to the Import page:

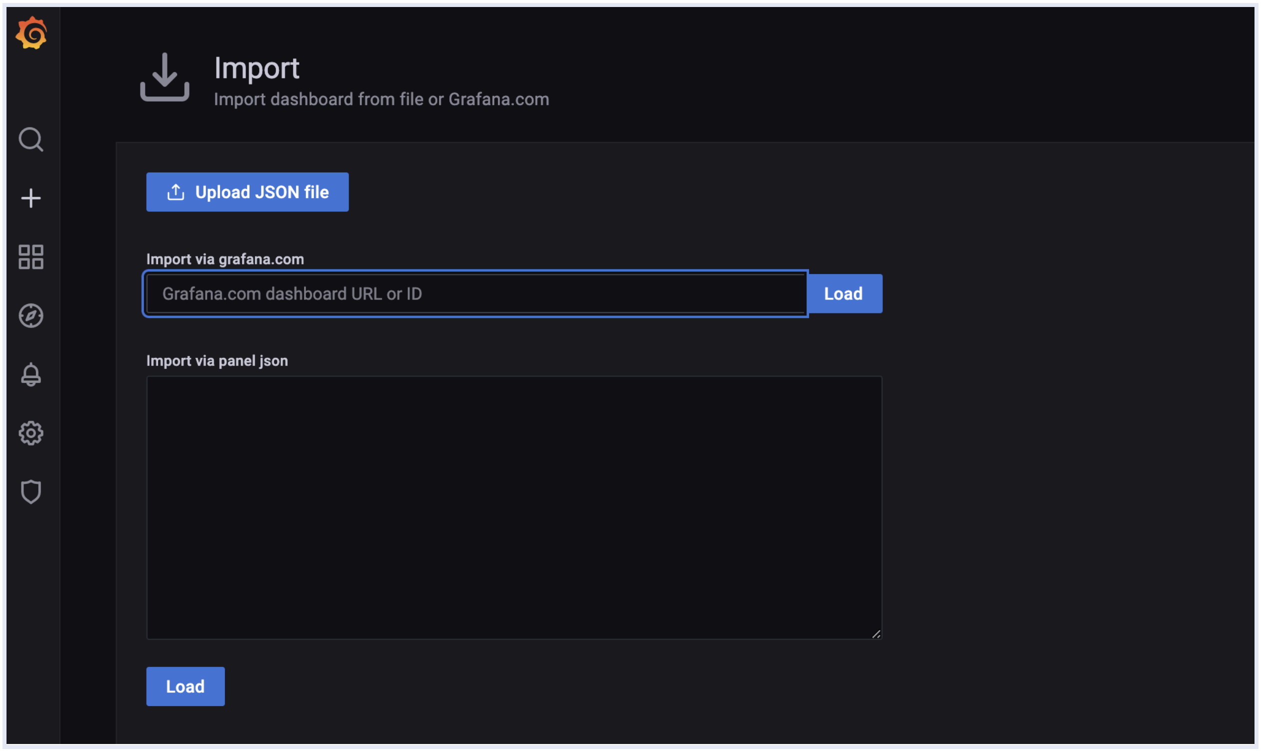


Configure your Prometheus data source below

Or skip the effort and get Prometheus (and Loki) as fully-managed, scalable, and hosted data sources from Grafana Labs with the free-forever Grafana Cloud plan.

Prometheus

Here, you can upload the JSON file of the dashboard or paste the Grafana Dashboard ID:



Add the Grafana dashboard ID, which you can find on the Grafana page for the MongoDB overview dashboard:

Reference:

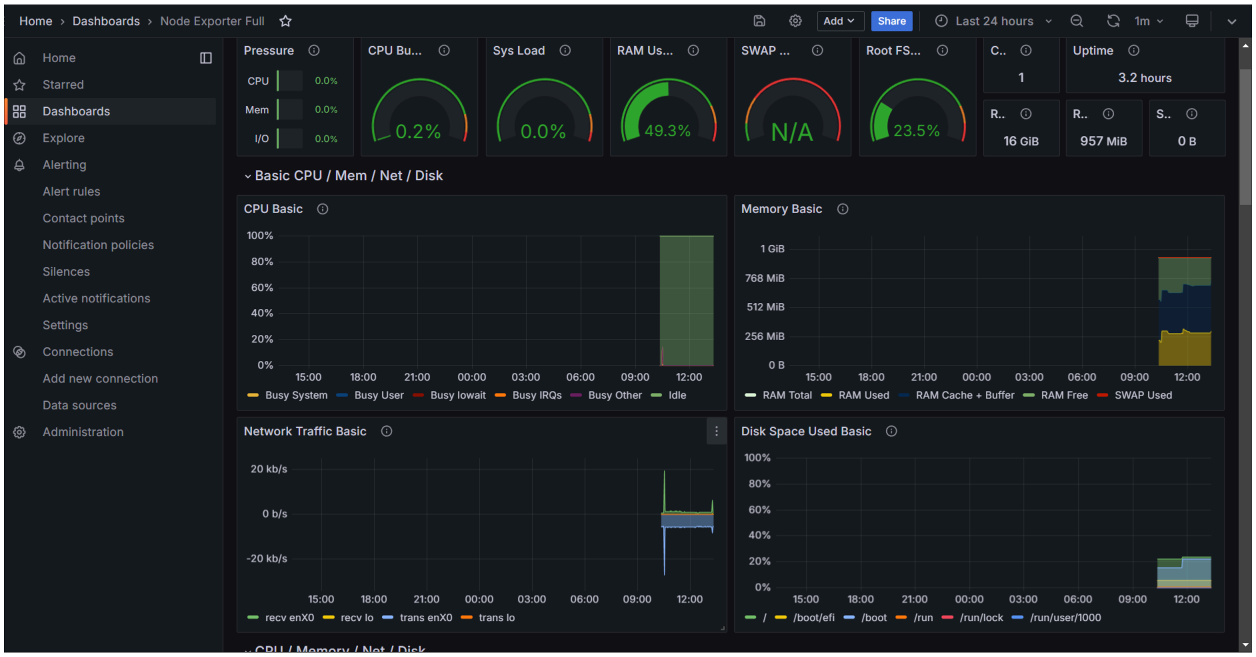
https://grafana.com/grafana/dashboards/1860

Many dashboards are available. You can find more by visiting the Grafana page on dashboards.

After adding the dashboard ID, click on Load.

Now an Options page will open, where you can provide a name for the dashboard, select the folder for the dashboard, and select a data source. You can leave the dashboard and folder names as the default. For the data source, choose Prometheus. Once you have filled in the options, click on Import.

The dashboard will be created:



Your dashboard will show real-time updates of your MongoDB database, including command operations, connections, cursors, document operations, and queued operations.