

HKOSCon 2024

Metrics, Logs, Traces and Profiles with Grafana LGTM

Wong Hoi Sing, Edison

2024-07-06

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Introduction

About Me

- Wong Hoi Sing, Edison (hswong3i)
- 2005: Drupal Developer & Contributor
- 2008: HKDUG, Founder
- 2010: PantaRei Design, Founder
- 2020: HKOSCON 2020, Speaker
- 2021: AlviStack, Founder
- 2022: HKOSCON 2022, Speaker
- 2024: Most Active GitHub user in Hong Kong





DMC-FZ18 F2.8 1/30s ISO100



CLOUD NATIVE LANDSCAPE EXPLORE GUIDE STATS Search items

AlviStack Vagrant Box Packaging for Kubernetes

PantaRei Design Limited

Platform Certified Kubernetes - Installer

This Vagrant Box provides Libvirt and VirtualBox image for running Kubernetes in single node all-in-one mode.

Repositories

alvistack/vagrant-kubernetes (primary)

<https://github.com/alvistack/vagrant-kubernetes> PRIMARY Apache License 2.0 good first issues 0 open

24 Stars 1 Contributors Oct '20 First commit Jul '24 Latest commit Jul '21 Latest release

Participation stats

Languages

AlviStack – Hong Kong Based Kubernetes Distribution



Time: 10:15 – 11:15
Language: English

Search

SEARCH



Schedule



Speakers

Mr. Edison Wong Hoi Sing

Mr. Eason Lai

Ms. Amanda Lam

Mr. Cyrus Wong

Mr. Davide Benvegnu

Mr. Ivan Ma

github-actions[bot] · Update Hong Kong · 36fb409 · 3 Weeks ago · History

[Preview](#) [Code](#) [Blame](#) 11368 lines (11354 loc) · 320 KB Code 55% faster with GitHub Copilot

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Top GitHub Users passing Views 827278

The `public contributions` and `private contributions` by users in Hong Kong on `2024/6/11 12:56 AM UTC`. This list contains users from `Hong Kong` and cities `Hong-kong` `Kowloon`.

There are `138 countries` and `674 cities` can be found [here](#).

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1	hswong3i Wong Hoi Sing Edison	Http://pantarei-desi	hswong3i	Hong Kong	42611	42611
2	BattlefieldDuck TatLead	No Company	BattlefieldDuck	Hong Kong	26207	30200
3	dirkarnez Dirk Arnez	Freelance	No Twitter Username	Hong Kong	7944	15359
	HTCAzuroY1212	@teamhartex.l	No Twitter			

Contact Me

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- Phone: +852 3576 3812
- Fax: +852 3753 3663
- Email: sales@pantarei-design.com
- Web: <http://pantarei-design.com>

References

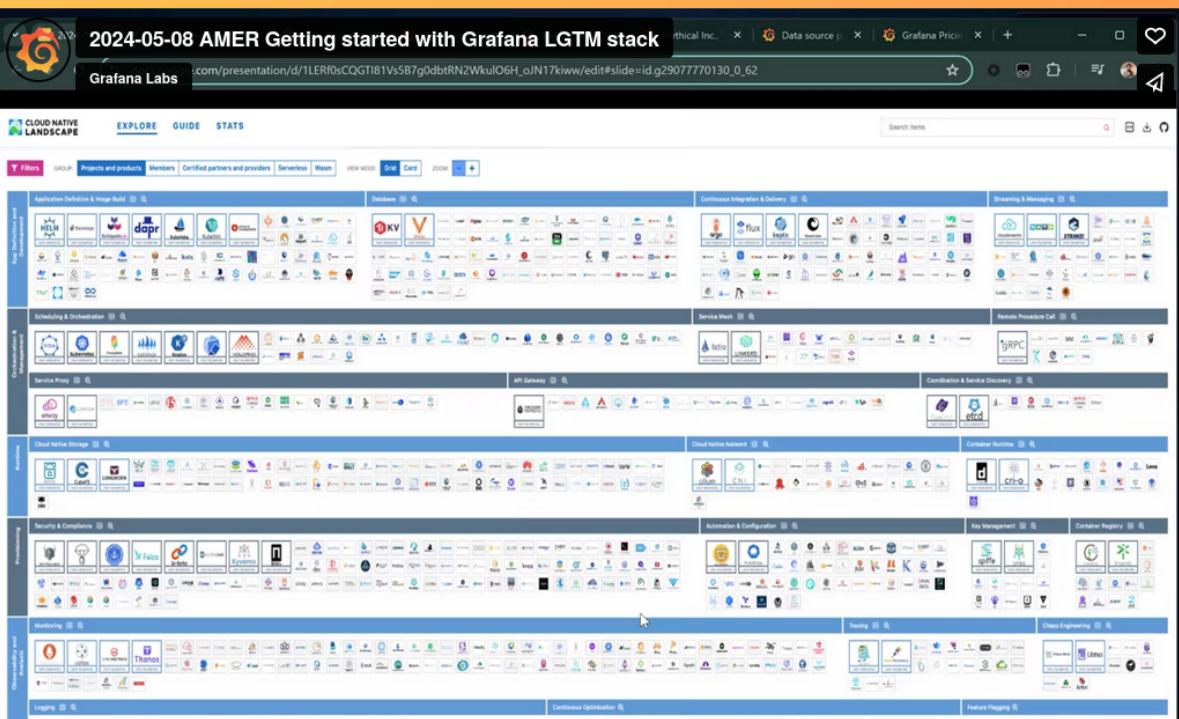
- Getting started with managing your metrics, logs, and traces using Grafana
 - Official webinar from Grafana Labs
 - For beginner with simple show case
 - Around 60 mintues
-

Grafana Labs Products Open source Solutions Learn Docs Company

English

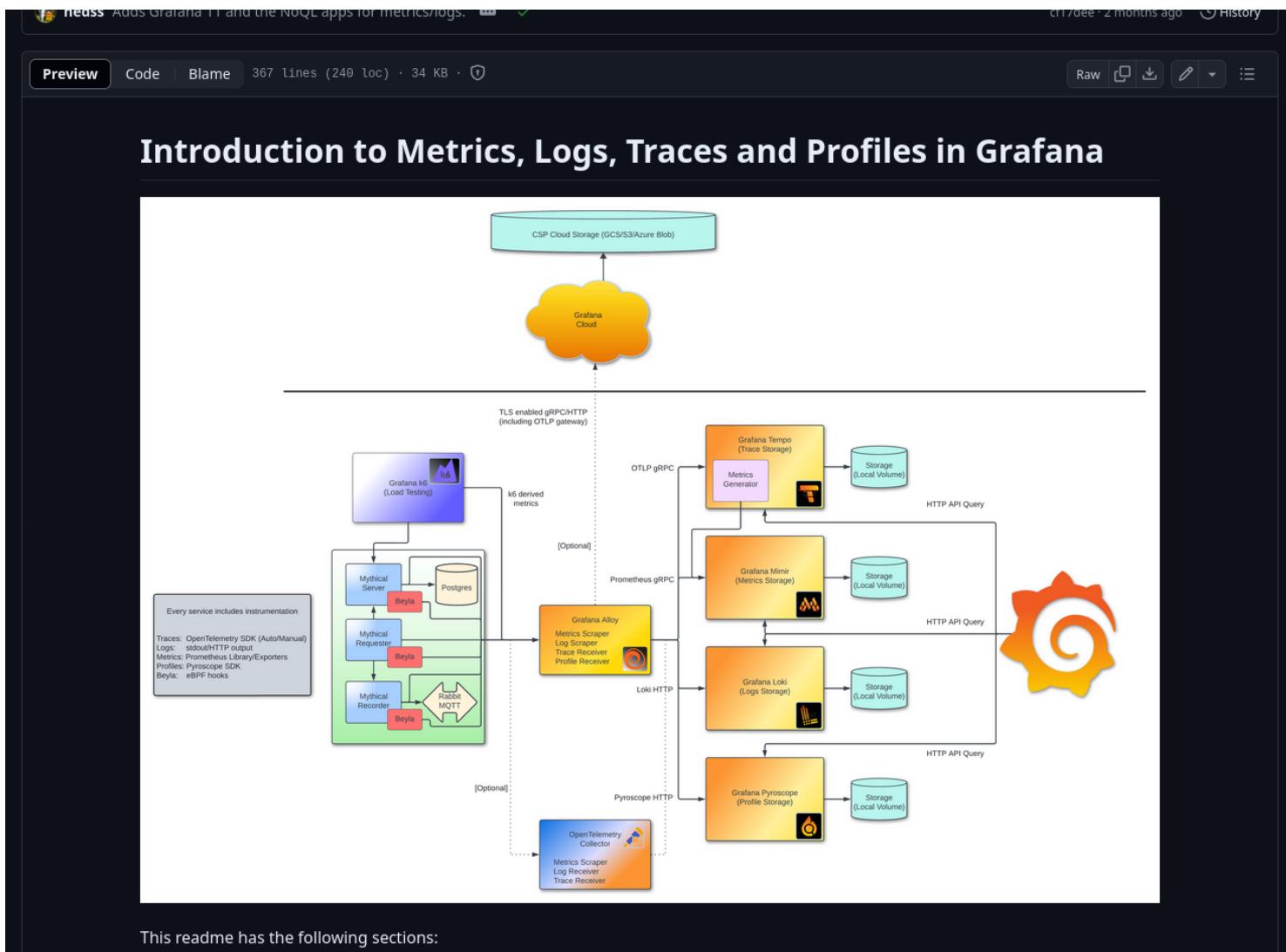
Getting started with managing your metrics, logs, and traces using Grafana

Share this: [in](#) [Twitter](#)



The screenshot shows the Grafana Cloud Native Landscape dashboard. The top navigation bar includes links for Products, Open source, Solutions, Learn, Docs, Company, a search icon, Downloads, Contact us, and Sign in. Below the navigation is a language dropdown set to English. The main title is "Getting started with managing your metrics, logs, and traces using Grafana". A "Share this" button with links for LinkedIn and Twitter is present. The dashboard itself is titled "2024-05-08 AMER Getting started with Grafana LGTM stack" and displays a grid of icons representing various open-source projects and tools, categorized into sections like Application Definition & Image Build, Container Integration & Delivery, Streaming & Messaging, Scheduling & Orchestration, Service Mesh, Remote Procedure Call, Service Proxy, API Gateway, Coordination & Service Discovery, Cloud Native Storage, Cloud Native Networks, Container Runtime, Security & Compliance, Automation & Configuration, Key Management, Container Registry, Monitoring, Testing, DevOps Engineering, Logging, Continuous Optimization, and Feature Flipping.

- Introduction to Metrics, Logs, Traces and Profiles in Grafana
 - Official complete demo for Grafana LGTM stack
 - For advance user with Docker + Docker Compose experience
 - Around 2 hours
-



- 可觀測性宇宙的第一天 - Grafana LGTM 全家桶的起點
 - Detail explanation for Grafana LGTM + Kubernetes
 - For advance user with daily Kubernetes experience
 - AT LEAST 6 HOURS (reading doc only…)
-



可觀測性宇宙的第一天 - Grafana LGTM 全家桶的起點

15th 鐵人賽

kubernetes

grafana

observability

可觀測性



mikehsu0618

團隊 所以隊名要叫什麼

2023-09-16 00:36:13

6984 瀏覽

分享至



前言

這是一個從異世界歸來後，一個不小心踏入 Kubernetes 可觀測性宇宙的故事，一切都要從一個非本科小白在愚昧山丘的頂端遇見 Grafana 開始說起。

- AlviStack Vagrant Box Packaging for Kubernetes
 - CNCF Certified Kubernetes on Virtual Box or Libvirt
 - Simply `vagrant up` and ready for use
 - May customize for Dev/CI/CD
 - Around 10 minutes
-



alvistack/kubernetes-1.30 Vagrant box

How to use this box with [Vagrant](#):

Vagrantfile [New](#)

```
Vagrant.configure("2") do |config|
  config.vm.box = "alvistack/kubernetes-1.30"
end
```

[v20240629.1.1](#) currently released version

This version was created 6 days ago.

There isn't a description.

2 providers for this version.

libvirt

[unknown *](#)

Hosted by Vagrant Cloud (1.75 GB)



virtualbox

[unknown *](#)

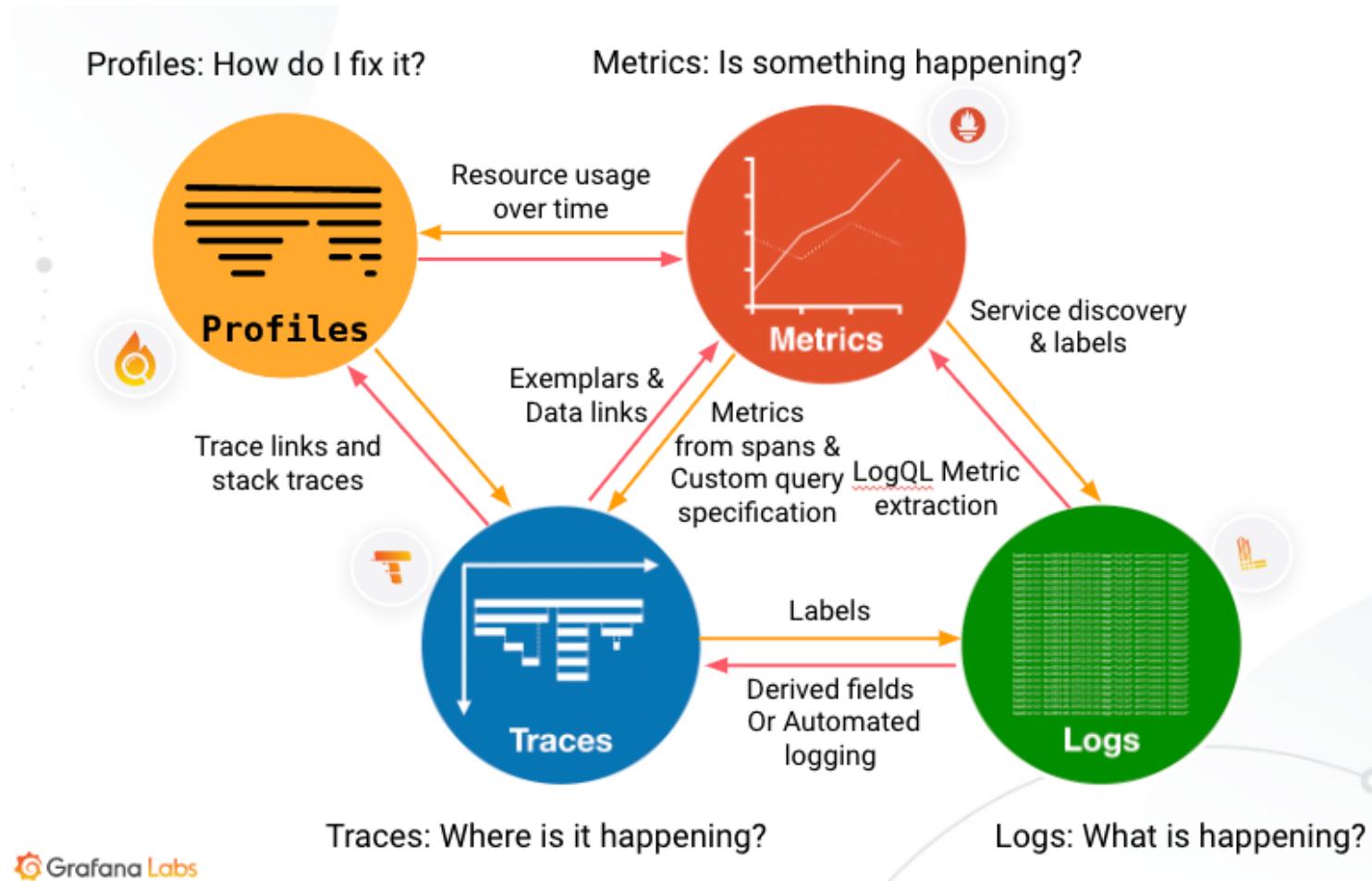
Hosted by Vagrant Cloud (1.68 GB)



What is Grafana LGTM Stack?

Prometheus + LGTM Stack + Pyroscope

- Monitoring: Collects and stores metrics as time series data
 - Logs: What is happening?
 - Metrics: Is something happening?
 - Traces: Where is it happening?
 - Profiles: How do I fix it?
 - Dashboard: Data visualization and monitoring
-

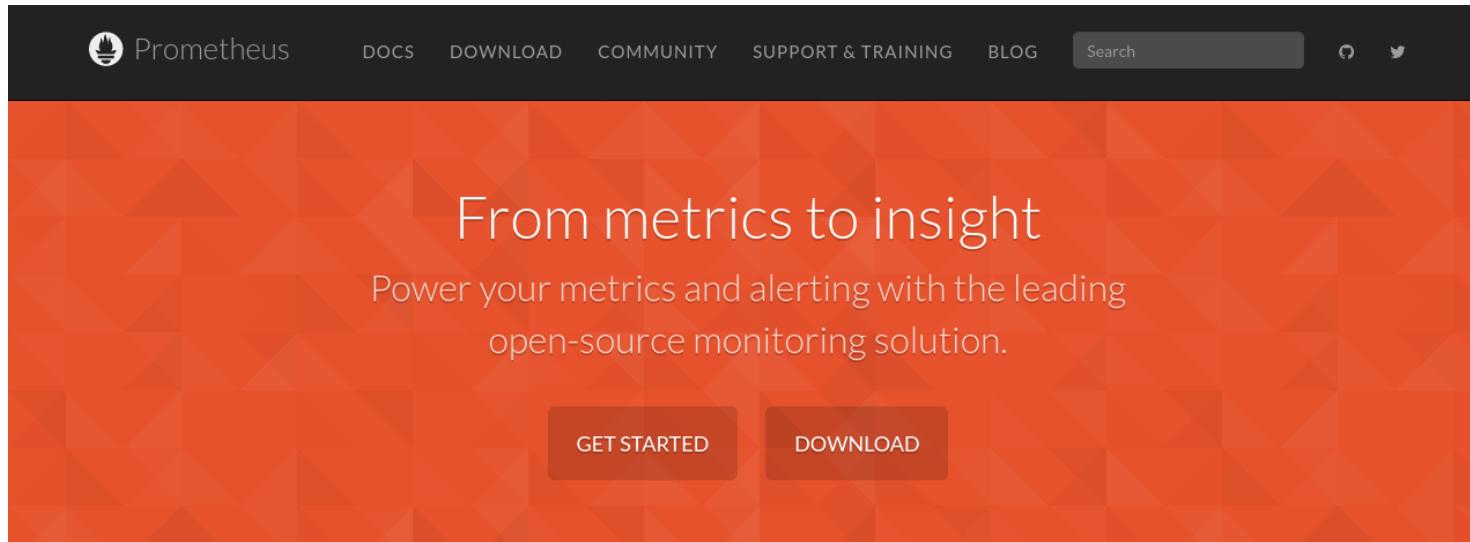


Grafana Labs

Prometheus

- Prometheus is a systems monitoring and alerting toolkit
- Multi-dimensional data model

- PromQL, a flexible query language to leverage this dimensionality
 - 2nd CNCF graduated project after Kubernetes
 - Apache License 2.0
-



The banner features the Prometheus logo at the top left, followed by navigation links: DOCS, DOWNLOAD, COMMUNITY, SUPPORT & TRAINING, and BLOG. A search bar and social media icons for GitHub and Twitter are also present. The central text reads "From metrics to insight" and "Power your metrics and alerting with the leading open-source monitoring solution." Below the text are two buttons: "GET STARTED" and "DOWNLOAD".

From metrics to insight

Power your metrics and alerting with the leading open-source monitoring solution.

[GET STARTED](#) [DOWNLOAD](#)

➊ Dimensional data

Prometheus implements a highly dimensional data model. Time series are identified by a metric name and a set of key-value pairs.

➋ Powerful queries

PromQL allows slicing and dicing of collected time series data in order to generate ad-hoc graphs, tables, and alerts.

➌ Great visualization

Prometheus has multiple modes for visualizing data: a built-in expression browser, Grafana integration, and a console template language.

➍ Efficient storage

Prometheus stores time series in memory and on local disk in an efficient custom format. Scaling is achieved by functional sharding and federation.

➎ Simple operation

Each server is independent for reliability, relying only on local storage. Written in Go, all binaries are statically linked and easy to deploy.

➏ Precise alerting

Alerts are defined based on Prometheus's flexible PromQL and maintain dimensional information. An alertmanager handles notifications and silencing.

➐ Many client libraries

Client libraries allow easy instrumentation of services. Over ten languages are supported already and custom libraries are easy to implement.

➑ Many integrations

Existing exporters allow bridging of third-party data into Prometheus. Examples: system statistics, as well as Docker, HAProxy, StatsD, and JMX metrics.

- Prometheus Operator deploy with Kubernetes CRDs
 - kube-prometheus provides example configurations for a complete cluster monitoring stack
 - Here we are going to demo with kube-prometheus-stack with Helm chart style
-

helm-charts / charts / kube-prometheus-stack / [↑ Top](#)

kube-prometheus-stack

Installs the [kube-prometheus stack](#), a collection of Kubernetes manifests, [Grafana](#) dashboards, and [Prometheus rules](#) combined with documentation and scripts to provide easy to operate end-to-end Kubernetes cluster monitoring with [Prometheus](#) using the [Prometheus Operator](#).

See the [kube-prometheus](#) README for details about components, dashboards, and alerts.

Note: This chart was formerly named `prometheus-operator` chart, now renamed to more clearly reflect that it installs the `kube-prometheus` project stack, within which Prometheus Operator is only one component.

Prerequisites

- Kubernetes 1.19+
- Helm 3+

Get Helm Repository Info

```
helm repo add prometheus-community https://prometheus-community.github.io/helm-charts
helm repo update
```

See [helm repo](#) for command documentation.

Install Helm Chart

```
helm install [RELEASE_NAME] prometheus-community/kube-prometheus-stack
```

See [configuration](#) below.

See [helm install](#) for command documentation.

Dependencies

Grafana

- Grafana is a multi-platform open source analytics and interactive visualization web application
 - It can produce charts, graphs, and alerts for the web when connected to supported data sources
 - AGPLv3
-

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Grafana OSS

Visualize your data, optimize your performance

Easily collect, correlate, and visualize data with beautiful dashboards using Grafana — the open source data visualization and monitoring solution that drives informed decisions, enhances system performance, and streamlines troubleshooting.

The easiest way to get started with the latest version of Grafana is with [Grafana Cloud](#), our fully managed observability stack.

[Download](#) [Docs](#) [GitHub](#)



 Transform data into real-time insights
Grafana's growing suite of visualizations, ranging from time series graphs to heatmaps to cutting-edge 3D charts, help you decode complex datasets.

 Seamlessly build a single pane of glass
With 150+ Grafana plugins, you can unify all your data sources into a single dashboard to streamline data monitoring and troubleshooting.

 Resolve issues faster with Grafana Alerting
Alert on data from a wide variety of data sources to identify problems and fix them quickly.

The evolution of Grafana

Inspired by the open source community and our growing number of users, Grafana introduces new innovations in every release to improve how you visualize, correlate, and share your data.

- Support multiple installation style, e.g. monolithic, microservice, or even manually
 - Here we are going to demo with distributed Helm chart style
-

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Product: Grafana

Viewing: v11.1 (latest)

Find another version

Grafana documentation

- What's new
- Breaking changes
- Upgrade Grafana
- About Grafana
- Introduction
- Get started with Grafana Open Source

Set up

- Install Grafana
 - Debian or Ubuntu
 - RHEL or Fedora
 - SUSE or openSUSE
 - Grafana Docker image
 - Grafana on Kubernetes
 - Grafana on Helm Charts
 - macOS
 - Windows
- Configure Grafana
- Start Grafana
- Sign in to Grafana

Documentation > Grafana documentation > Set up > Install Grafana > Grafana on Helm Charts

Open source

Deploy Grafana using Helm Charts

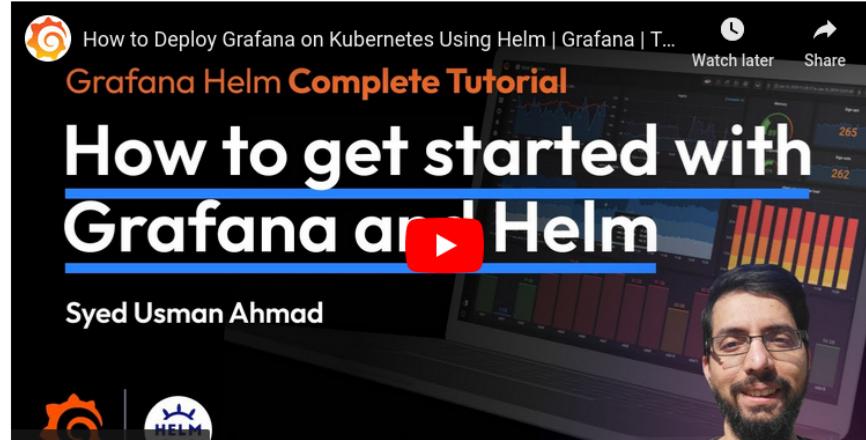
This topic includes instructions for installing and running Grafana on Kubernetes using Helm Charts.

Helm is an open-source command line tool used for managing Kubernetes applications. It is a graduate project in the [CNCF Landscape](#).

NOTE

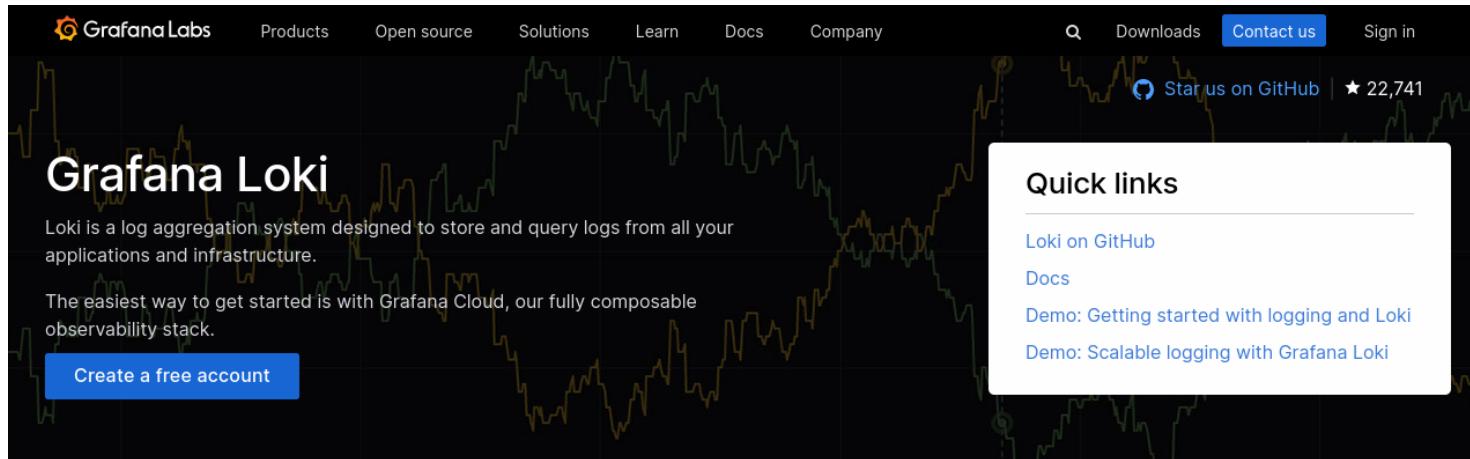
The Grafana open-source community offers Helm Charts for running it on Kubernetes. Please be aware that the code is provided without any warranties. If you encounter any problems, you can report them to the [Official GitHub repository](#).

Watch this video to learn more about installing Grafana using Helm Charts:



Loki

- Loki is a backend store for long-term log retention
 - Designed to be very cost effective and highly scalable
 - AGPLv3
-



Grafana Loki

Loki is a horizontally scalable, highly available, multi-tenant log aggregation system inspired by Prometheus. It is designed to be very cost effective and easy to operate. It does not index the contents of the logs, but rather a set of labels for each log stream.

The Loki project was started at Grafana Labs in 2018, and announced at [KubeCon Seattle](#).
Loki is released under the AGPLv3 license.

Grafana Labs is proud to lead the development of the Loki project, building first-class support for Loki into Grafana, and ensuring Grafana Labs customers receive Loki support and features they need.

Why use Grafana Loki?

- Support multiple installation style, e.g. monolithic, microservice, or even manually
 - Here we are going to demo with distributed Helm chart style
-

The screenshot shows the Grafana Labs documentation website for Grafana Loki. The left sidebar is dark-themed and lists various installation methods: Release notes, Get started, Set up (with Install selected), Monitoring, Install using Tanka, Install using Docker, Install locally, Install on Istio, Install from source, Migrate, and Upgrade. Under Set up > Install, the 'Install microservice Loki' option is highlighted with an orange border. The main content area has a light background and displays the following text:

This Helm Chart deploys Grafana Loki on Kubernetes.

This chart configures Loki to run Loki in [microservice / distributed mode](#). The microservices deployment mode runs components of Loki as distinct processes.

The default Helm chart deploys the following components:

- **Compactor component** (1 replica): Compacts and processes stored data.
- **Distributor component** (3 replicas, maxUnavailable: 2): Distributes incoming requests. Up to 2 replicas can be unavailable during updates.
- **IndexGateway component** (2 replicas, maxUnavailable: 1): Handles indexing. Up to 1 replica can be unavailable during updates.
- **Ingestor component** (3 replicas): Handles ingestion of data.
- **Querier component** (3 replicas, maxUnavailable: 2): Processes queries. Up to 2 replicas can be unavailable during updates.
- **QueryFrontend component** (2 replicas, maxUnavailable: 1): Manages frontend queries. Up to 1 replica can be unavailable during updates.
- **QueryScheduler component** (2 replicas): Schedules queries.

It is not recommended to run scalable mode with [filesystem](#) storage. For the purpose of this guide, we will use MinIO as the object storage to provide a complete example.

Prerequisites

- Helm 3 or above. See [Installing Helm](#).
- A running Kubernetes cluster.
- (Optional) A Memcached deployment for better query performance. For information on configuring Memcached, refer to the [caching section](#).

To deploy Loki in microservice mode (with MinIO):

Tempo

- Tempo is a distributed tracing backend
 - Designed to be cost-efficient, requiring only object storage to operate
 - Deeply integrated with Grafana, Prometheus, and Loki
 - AGPLv3
-

The screenshot shows the Grafana Labs website with a dark header bar. The header includes the Grafana Labs logo, navigation links for Products, Open source, Solutions, Learn, Docs, and Company, a search icon, Downloads, Contact us (highlighted in blue), and Sign in. Below the header, there's a GitHub star button with 'Star us on GitHub | ★ 3,758'. The main content area features a section titled 'About Grafana Tempo' with a sub-section about Grafana Tempo's cost-efficiency and a 'Create free account' button. To the right, a 'Quick links' sidebar contains links to Demo, GitHub Project, Docs, and a 'Demo: Get started with Grafana Tempo' button.



Introduction to Grafana Tempo

Grafana Tempo is an open source, easy-to-use, and high-scale distributed tracing backend. Tempo is cost-efficient, requiring only object storage to operate, and is deeply integrated with Grafana, Prometheus, and Loki. Tempo can ingest common open source tracing protocols, including Jaeger, Zipkin, and OpenTelemetry.

The Tempo project was started at Grafana Labs and announced at Grafana ObservabilityCON in October 2020. It became generally available with the 1.0 release in June 2021. Tempo is released under the AGPLv3 license.

Grafana Labs is proud to lead the development of the Tempo project, building first-class support for Tempo into Grafana, and ensuring Grafana Labs customers receive Tempo support and features they need.

The Goal

Sample 100% of our read path

- Support multiple installation style, e.g. monolithic, microservice, or even manually
 - Here we are going to demo with distributed Helm chart style
-

The screenshot shows the Grafana Labs documentation website for Grafana Tempo. The left sidebar is dark-themed and contains a search bar, a product dropdown set to 'Grafana Tempo', and a navigation menu. The main content area has a light background and displays the 'Deploy Tempo with Helm' page. It includes a breadcrumb trail, a 'Documentation' button, and sections for 'Deploy Tempo with Helm' and 'Example Helm chart'. The 'Deploy with Helm' section is highlighted with an orange border. The footer features social media icons and links for 'Suggest an edit', 'Contribute to docs', 'Report a problem', 'Community', and 'Support'.

Grafana Labs documentation

Products Open source Solutions Learn Docs Company

Documentation > Grafana Tempo > Set up > Deploy with Helm

Open source

Product

Grafana Tempo

Viewing: v2.5.x (latest)

Find another version

Grafana Tempo

› Release notes

› Introduction

› Get started

Set up

› Plan your deployment

Upgrade

Deploy with Helm

› Deploy with operator

Deploy on Linux

Deploy on Kubernetes with Tanka

Set up a test application for a Tempo cluster

› Configure

› Manage

› Metrics-generator

› Query with TraceQL

› Troubleshoot

› API

Community

Search docs

Deploy Tempo with Helm

The Helm charts for Grafana Tempo and Grafana Enterprise Traces allows you to configure, install, and upgrade Grafana Tempo or Grafana Enterprise Traces within a Kubernetes cluster.

To deploy Tempo using the `tempo-distributed` Helm chart, read the [Get started with Grafana Tempo using Helm](#).

Example Helm chart

The Tempo repository has an [example Helm chart](#) that shows a complete microservice-based deployment.

Helm charts for deployment

Tempo has two primary charts used for deployment:

- `tempo-distributed` Helm chart deploys Tempo in microservices mode ([read the documentation](#))
- `tempo` Helm chart deploys Tempo in monolithic (single binary) mode

Was this page helpful?

Yes No

Suggest an edit Contribute to docs Report a problem

Community Support

Mimir

- Mimir is a TSDB for long-term storage for Prometheus
 - Designed to be horizontally scalable, highly available, multi-tenant
 - 100% Prometheus compatible
 - AGPLv3
-

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Star us on GitHub | ★ 3,858

What is Grafana Mimir?

Mimir is an open source, horizontally scalable, highly available, multi-tenant TSDB for long-term storage for Prometheus.

[Read the announcement blog post →](#)

Get Mimir up and running in 10 minutes:

[Tutorial](#) [Intro to metrics webinar](#)

Introducing Grafana Mimir
Grafana Mimir: Open Source time series database

Prometheus or Grafana Agent
Scrape metrics from your applications and remote write these metrics to Mimir

Mimir
Replica 1 — Replica N

Grafana
Query metrics from Mimir

05:00



Mimir overview

Mimir lets you scale metrics to 1 billion active series and beyond, with high availability, multi-tenancy, durable storage, and blazing fast query performance over long periods of time.

Mimir was started at Grafana Labs and [announced in 2022](#). The mission for the project is to make it the most scalable, most performant open source time series database for metrics, by incorporating what Grafana Labs engineers have learned running Grafana Enterprise Metrics and Grafana Cloud Metrics at massive scale. Mimir is released under the AGPLv3 license.

Grafana Labs is proud to lead the development of the Mimir project, building first-class support for Mimir into Grafana, and ensuring Grafana Labs customers receive Mimir support and features they need.

- Support multiple installation style, e.g. monolithic, microservice, or even manually
 - Here we are going to demo with distributed Helm chart style
-

Grafana Labs documentation

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Product

Grafana Mimir

Viewing: v2.12.x (latest)

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Grafana Mimir

Release notes

Get started

Set up

Deploy with Helm

Deploy with Puppet

Deploy with Jsonnet and Tanka

Migrate

Configure

Send

Manage

Query

Visualize

References

Copyright notice

Documentation > Grafana Mimir > Set up > Deploy with Helm

Open source

Deploy Mimir with Helm

The [mimir-distributed Helm chart](#) for Grafana Mimir and Grafana Enterprise Metrics allows you to configure, install, and upgrade Grafana Mimir or Grafana Enterprise Metrics within a Kubernetes cluster.

To deploy Mimir using the [mimir-distributed Helm chart](#), see [Get started with Grafana Mimir using the Helm chart](#).

Was this page helpful?

Yes No

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Community Support

Related documentation

Docs Deploying the Grafana Mimir monitoring mixin

Docs Grafana mimir-distributed Helm chart documentation

Docs Monitor Grafana Mimir

Pyroscope

- Pyroscope is a continuous profiling database
 - Designed to be fast, scalable, highly available, and efficient storage and querying
 - AGPLv3
-

ANNOUNCEMENT

Grafana Cloud Profiles, powered by Pyroscope, is now GA

[Learn more →](#)

Continuous profiling

What is Grafana Pyroscope?

Grafana Pyroscope is an open source continuous profiling database that provides fast, scalable, highly available, and efficient storage and querying. This helps you get a better understanding of resource usage in your applications down to the line number.

[GitHub project](#) [Blog announcement](#) [Documentation](#)

Star us on GitHub | ★ 9,643



Grafana Pyroscope overview

Grafana Pyroscope allows you to aggregate continuous profiling data with high availability, multi-tenancy, and durable storage.

Grafana Pyroscope was formed by the merger of two open source continuous profiling projects: Phlare, which was launched by Grafana Labs in 2022, and Pyroscope, which was founded by Ryan Perry and Dmitry Filimonov in 2021. The mission for the Grafana Pyroscope project is to enable continuous profiling at scale for the open source community, giving developers a better understanding of the resource usage of their code. By doing so, Pyroscope allows users to understand their application performance and optimize their infrastructure spend.

Grafana Labs is proud to lead the development of the Grafana Pyroscope project. The project

- Support multiple installation style, e.g. monolithic, microservice, or even manually

- Here we are going to demo with distributed Helm chart style
-

The screenshot shows a dark-themed documentation page for Grafana Pyroscope. The left sidebar contains a navigation tree for the v1.6.x version, with 'Deploy with Helm' currently selected. The main content area displays the 'Deploy Pyroscope using the Helm chart' guide, which includes instructions for hardware and software requirements, and a section on verifying setup.

Grafana Labs documentation

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Documentation > Grafana Pyroscope > Deploy on Kubernetes > Deploy with Helm

Open source

Product

Grafana Pyroscope

Viewing: v1.6.x (latest)

Find another version

Grafana Pyroscope

- > Release notes
- > Introduction
- Get started
- > Configure the client to send profiles
- Upgrade
- Deploy on Kubernetes
 - Deploy with Helm
 - Deploy with Jsonnet and Tanka
- > Configure the server
- > View and analyze profile data
- > Reference: Pyroscope Architecture
- Copyright notice

Deploy Pyroscope using the Helm chart

The [Helm](#) chart allows you to configure, install, and upgrade Pyroscope within a Kubernetes cluster.

Before you begin

These instructions are common across any flavor of Kubernetes and assume that you know how to install, configure, and operate a Kubernetes cluster as well as use `kubectl`.

Hardware requirements:

- A single Kubernetes node with a minimum of 4 cores and 16GiB RAM

Software requirements:

- Kubernetes 1.20 or higher
- The `kubectl` command for your version of Kubernetes
- Helm 3 or higher

Verify that you have:

- Access to the Kubernetes cluster
- Persistent storage is enabled in the Kubernetes cluster, which has a default storage class set up. You can [change the default StorageClass](#).
- DNS service works in the Kubernetes cluster

Install the Helm chart in a custom namespace

Use a custom namespace so that you don't have to overwrite the default namespace later in the procedure.

Demo with AlviStack Vagrant Box

Install VirtualBox

Install Vagrant

Prepare Vagrantfile

vagrant up

vagrant ssh

http://localhost:8080/

Create a Grafana Dashboard

Connect with Data Sources

Q&A