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Our Agenda

01 Prometheus - What & Why?

02 Architecture & Components

03 Grafana - What & why

04 Benefits of Monitoring systems

05 Demo

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Prometheus

Introduction

- **Prometheus** is an open-source monitoring system with a dimensional data model, flexible query language, efficient time series database and modern alerting approach.

- It is widely used in many application development & operations to monitor the health & performance of servers, apps, cloud-native environments & also for kubernetes.

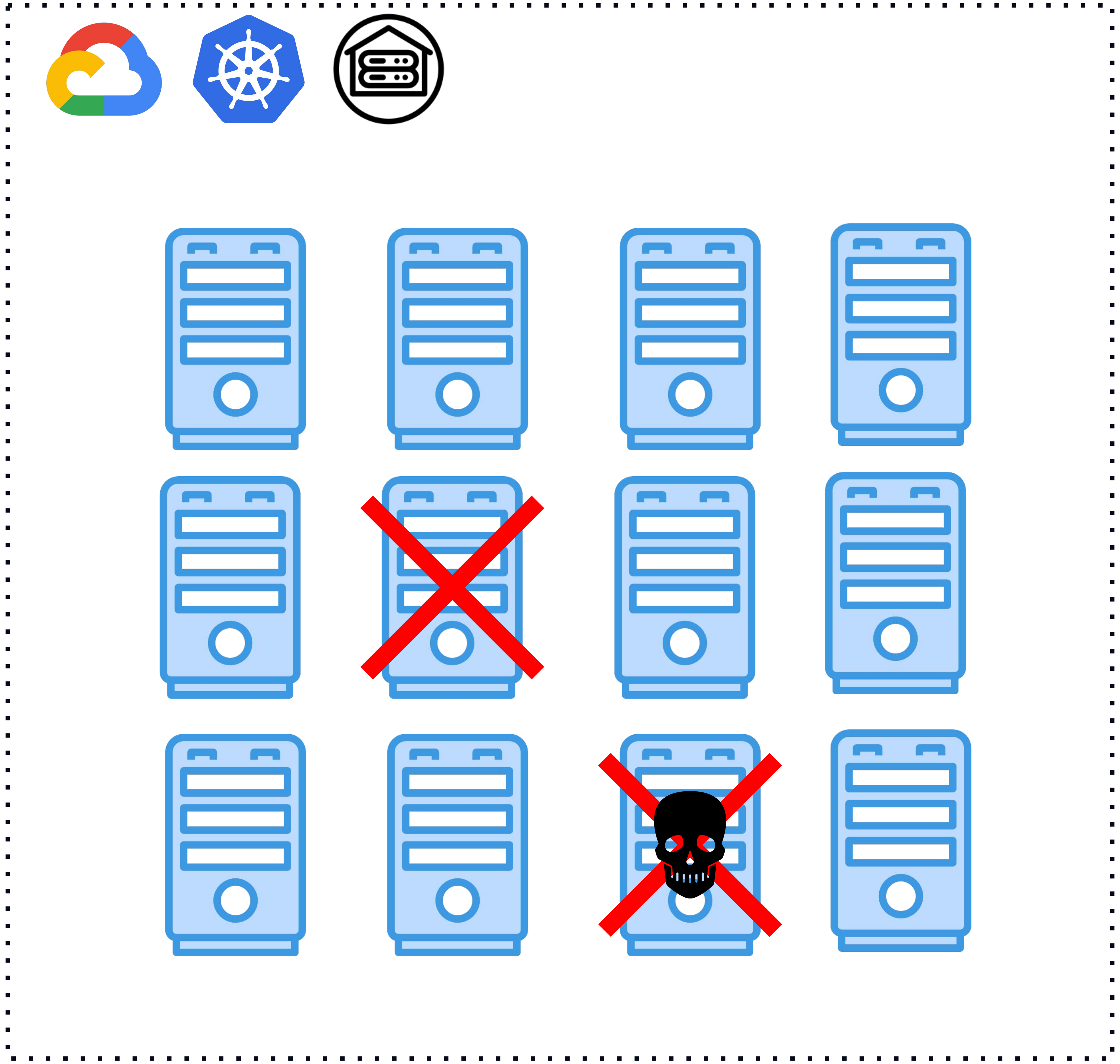
Open-source

- **License:** Apache License 2.0
- **Initial Release:** 24 November 2012
- **Written in:** Go

Why we need Prometheus?

Problem Statement

- Suppose you have 100 of applications servers & services running on your cloud, kubernetes, or somewhere on VMs.
- Some of them stopped working, failed due to high traffic some goes OOM, some are causing latency.
- How you will figure out which server is down or having issues & how you measure it?

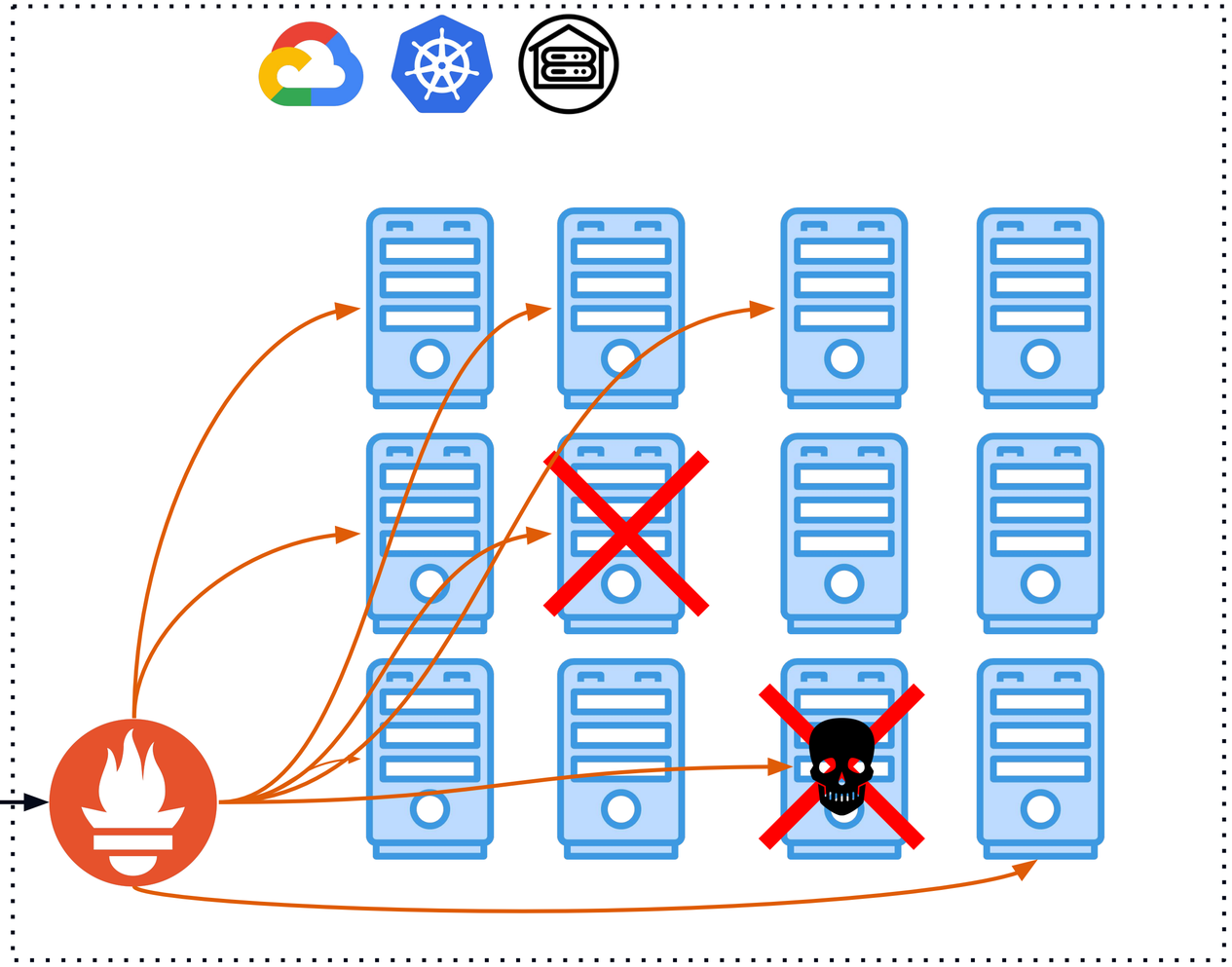


Why we need Prometheus?

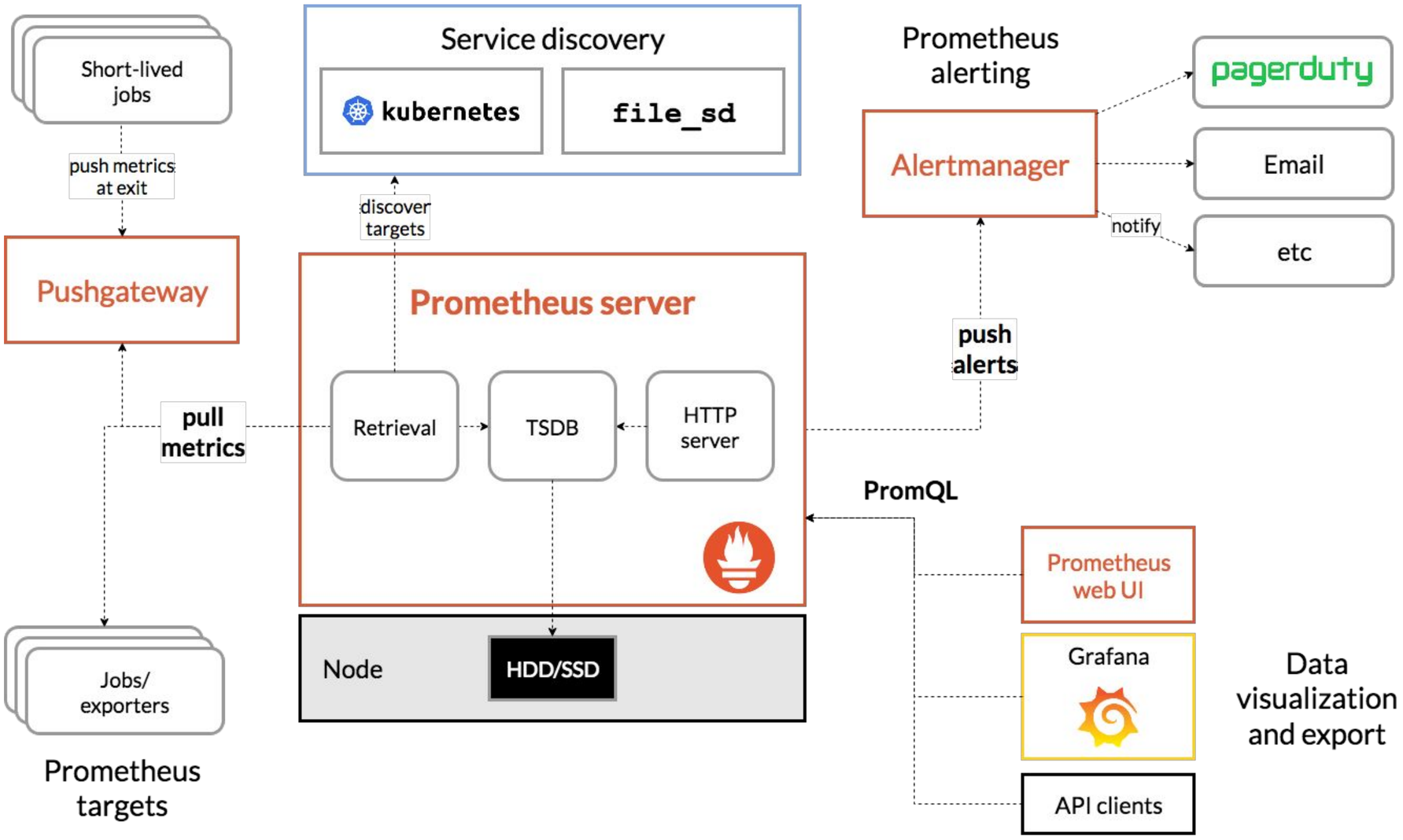
Prometheus in game

- **Prometheus** & Exporter will be setup which will produce server metrics & application metrics on a open port say 8200
- Configure Prometheus to scrape out these metrics from all endpoints on which prom-metrics are exposed and store them with a timestamp in its timeseries database.
- Once we start getting all metrics in prometheus server. We can monitor these metrics on each server & run PromQL query to figure out which server had an outage or having issues based on metrics.

Ops team



Architecture & Components



Targets & Metrics

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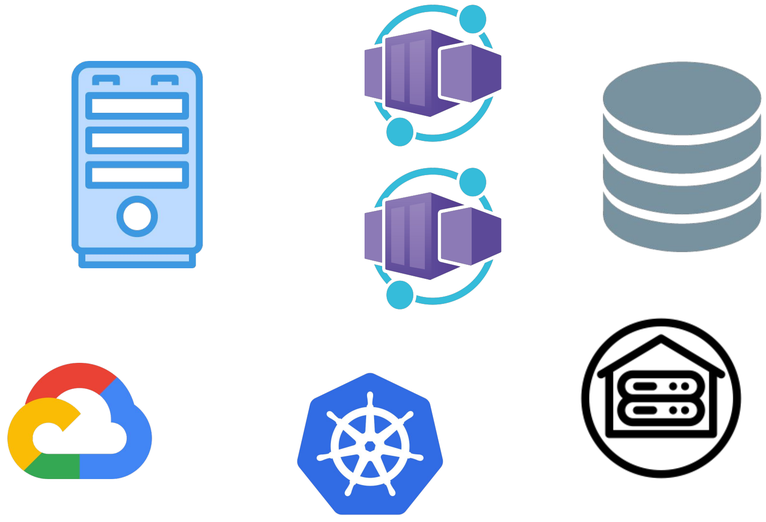
Targets

- Target is what is to monitor. For example linux machines or servers, web servers, Applications services, databases, cloud based services etc.



Metrics

Metrics are measurements & records in numbers with a timestamp what users want to measure differs from application to application. It can be of 3 types in prometheus.

- **Counter:** It's represents increasing count of event that happen. For example number of request on server.
- **Gauge:** It's instantaneous metric which tell single value at present for example current CPU usage.
- **Histogram:** This metric is used to measure how long an event is happening. For example request duration.

What is Grafana?

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Introduction

- **Grafana:** Grafana is a multi-platform open source analytics and interactive visualization web application. It provides charts, graphs, and alerts for the web when connected to supported data sources.

- It supports almost every monitoring database & also have support for logging systems. Can visualize every metrics, Logs, Traces in form of Graphs, logs, bars, Heatmap, tables etc.

Why we need Grafana?

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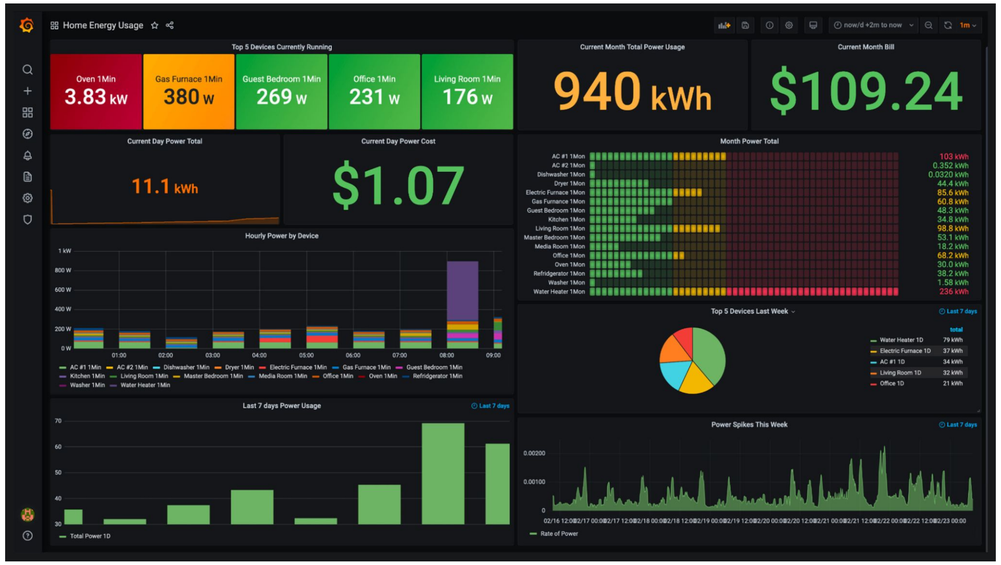
- **Why we need?** Suppose we have a metrics server with database which exposing metrics data on a webserver or on a endpoints. We need to make more in human-readable form & want to visualize metrics to see performance & health of our system.

- **Grafana in game:** You can build interactive dashboardsto visualize the performance of your system whether it linux server or cloud-native application. So we dont need to run those boring queries to see data or which service has outage. Grafana will show you all these information very beautifully.
- You can then setup alerts, annotations which will inform you whenever a service become unavailable or at what period of time service suffered from an outage through annotations.

Grafana Dashboard



Benefits of Monitoring systems

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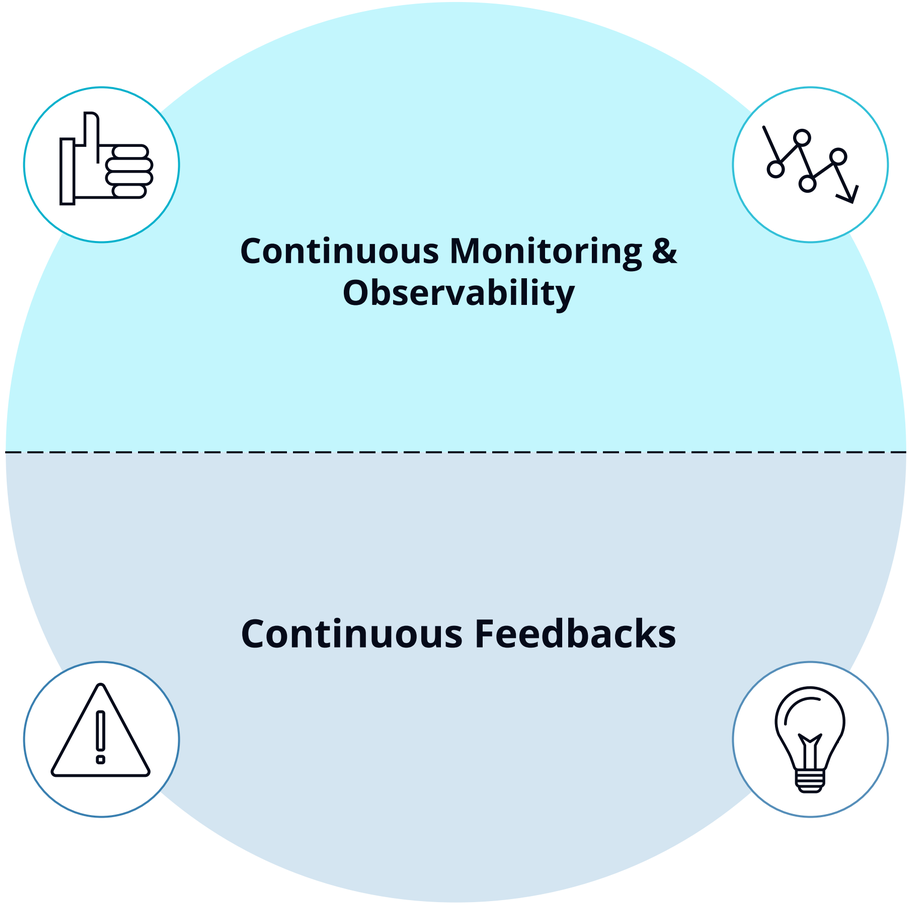
Performance Monitoring & Health

Failure Detection & Prevention



Alerts & Notifications

Ensure SLAs & enhance user-experience

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Demo

Deploy an Application

Deploy an application which will expose prom metrics on a open port & url path for HTTP pull scraping.

01

Deploy & setup Prometheus

Deploy & setup prometheus to scrape application metrics & store them into its TSDB.

02

Setup Grafana

Setup grafana & add datasource of prometheus to visualize metrics in graphs, bars & gauge.

03

Build dashboard & Alerts

Create dashboard in grafana to visualize application performance & setup alerts.

04