Prometheus

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What Is Prometheus?

Prometheus is a powerful, flexible, and reliable monitoring solution that helps you to **collect, store, and analyze time-series data** from a variety of sources, including systems and applications. Prometheus is widely used in the industry and it is a popular choice for monitoring distributed systems, such as microservices, and it is often used in combination with other tools for visualization and analysis.

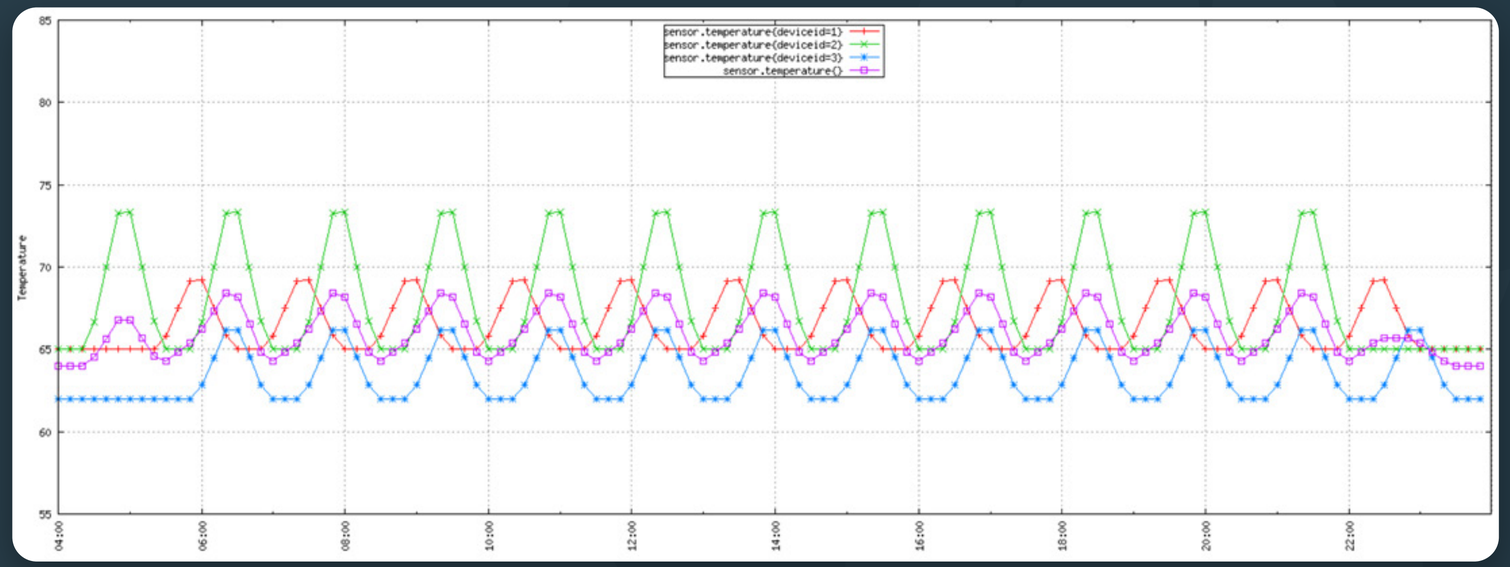
All system services, network traffic, virtual servers, and websites can be monitored using Prometheus. Prometheus checks the server's services and network on a regular basis and sends the results to the control screen. In the event of a negative situation, it will notify you via email or SMS.

It can manage information such as network traffic, service status (Mysql, Apache, etc.), server infrastructure (Disk, CPU, RAM etc.), and so on.

Some Infos About Prometheus

- **Time Series Database**

  Time series data is recording **how things change** over time.



- **Open Source**

  Source Code is available on **Github**

Some Infos About Prometheus

- **Monitoring Software**
  Monitoring software **observes and tracks the operations and activities of users, applications and network services on a computer or enterprise systems.**

- **Souncloud**
  Prometheus was **developed at SoundCloud** starting in 2012 and the official public announcement was made in January 2015.

- **Pull-Based Model**
  Instead of relying on agents to push data to the server, Prometheus actively scrapes data from target systems and applications using HTTP requests. This allows it to be more flexible and scalable, and it also makes it easier to set up and maintain.

- **PromQL**
  Prometheus includes a powerful query language, PromQL, which allows you to perform flexible and efficient queries on your data.

Why Is Prometheus Used?

Modern DevOps is becoming more and more complex to handle and therefore needs more automation.

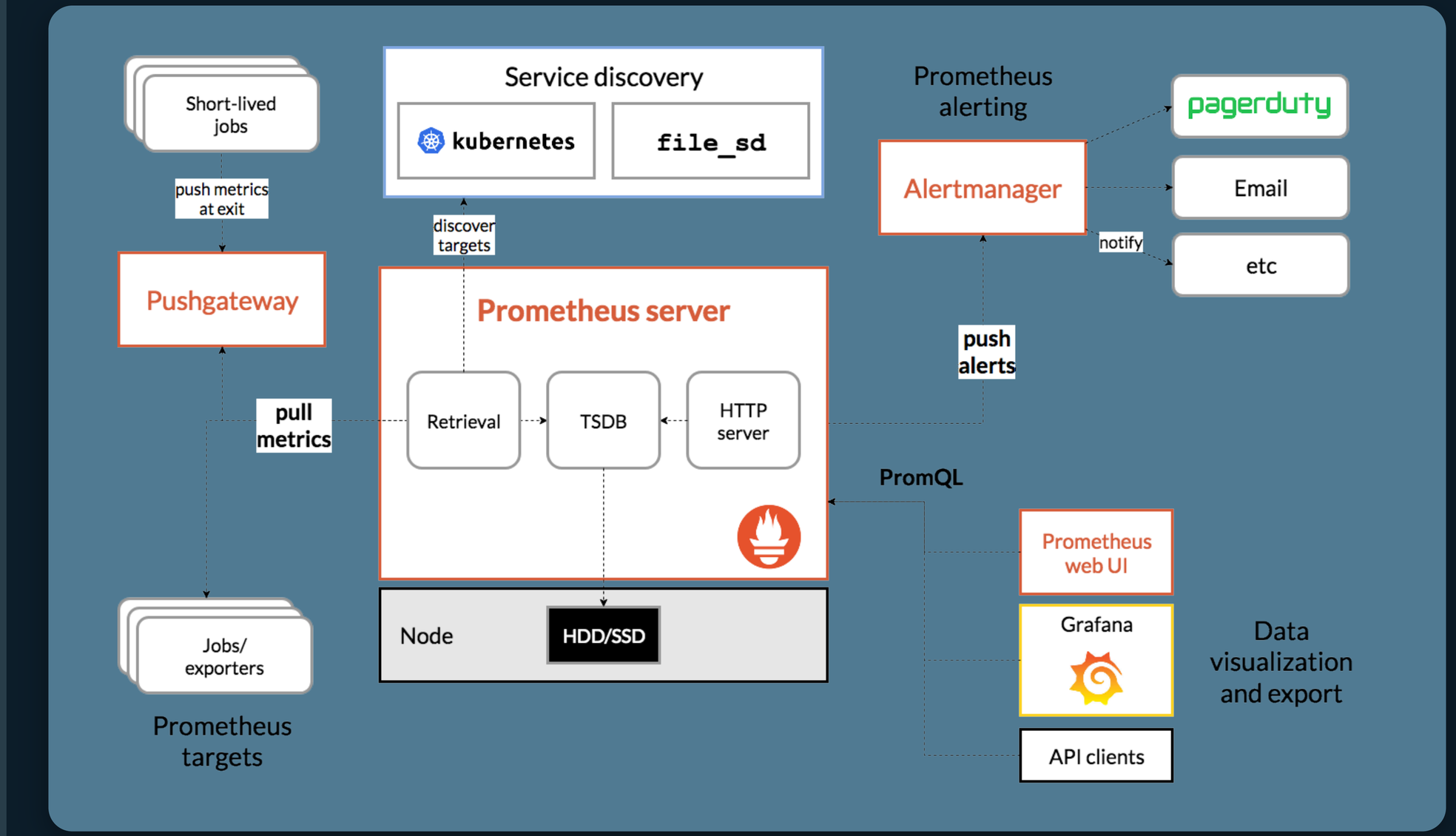
There are multiple servers that run containerized applications and there are hundreds of different processes running on that infrastructure and things are interconnected. So maintaining such setup to run smoothly and without application down times is very challenging. Imagine having such a complex infrastructure with loads of servers distributed over many locations and you have no insight of what is happening on hardware level or on application level like errors, response latency, hardware down or overloaded maybe running out of resources etc. In such complex there are more things that can go wrong when you have tons of services and applications deployed any one of them can crash and cause failure of other services and suddenly application becomes unavailable to users. You must quickly identify what exactly out of this hundred different things went wrong and that could be difficult and time-consuming when debugging the system manually.

Where Is Prometheus Used?

What will make the searching the problem process more efficient would be to have a tool that constantly monitors whether services are running and alerts the maintainers as soon as one service crashes. So you know exactly what happened or even better it identifies problems before they even occur and alerts the system administrators responsible for that infrastructure to prevent that issue.

For example one specific server ran out of memory that caused database parts to fail that database was used by an authentication service that also stopped working because the database became unavailable and then application that depended on that authentication service couldn't authenticate users in the ui anymore. In this case Prometheus would check regularly the status of memory usage on each server and when on one of the servers it spikes over for example 70 percent for over an hour or keeps increasing notify about the risk that the memory on that server might soon run out.

Prometheus Architecture



Grafana

Grafana is a visualization tool for Prometheus. Grafana allows us to collect data from a variety of sources and combine it into a single dashboard.

thank you for listening...