Updated 07/27/2023

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Thanos training

2 days (14 hours)

Presentation

Thanos is an open source extension to Prometheus providing a global view of queries, high availability, backup and affordable access to historical data, all in a single binary. Mainly linked to Prometheus, it is a tool for
used for metrics-based monitoring and alerting. It is a popular and powerful solution for Kubernetes monitoring. The Thanos project contains five main components:

- Thanos Sidecar: Main component that works with Prometheus, reading and archiving data
- Thanos Store: API gateway based on Prometheus historical data
- Thanos Query: Aggregator for query results from multiple sources (compatible with PromQL)
- Thanos Compact: Component that applies the Prometheus 2.0 compacting procedure to block data in object storage
- Thanos Ruler: Component that evaluates Prometheus registration and alert rules against the query API of your choice.

This group of microservices runs in parallel with the Prometheus deployment. One of these services (thanos-sidecar) runs as a container in the same pod as Prometheus. Thanos features can be deployed independently of each other. This makes it possible to have a subset of features ready for immediate benefit or testing, while making it flexible for progressive deployment in more complex environments. By the end of our training course, you'll know how to **build, contribute and deploy on Thanos.** This course will be presented with the latest version of Thanos, Thanos V0.23.0.

Objectives

- Building on Thanos
- Current Thanos deployment skills
- Mastering all Thanos components

Target audience

- Architects
- System administrators
- Developers
- DevOps engineers

Prerequisites

Knowledge of Kubernetes and Prometheus.

Thanos Training Program

Thanos features

- Centralized, global view of requests
  - Sharding approach
  - APIs and user interfaces
  - Prometheus and Grafana
- High availability
  - Advantages of using Thanos Sidecar
  - Benefits of using Thanos Query
- Storage of historical data
  - Search for new persistent data blocks
  - Cloud partners: Google Cloud Platform, Amazon S3, Microsoft Azure
- Easy metrics backup
- Long-term retention of metrics
- Ability to move between clusters
- Low-cost data access

The various components of the Thanos project

- Thanos Sidecar
- Thanos Store
- Thanos Query
- Thanos Compact
- Thanos Ruler

Link with Prometheus

- Thanos' dependence on Prometheus
- Building with Golang
- Optional object storage

Object storage

- Using configs flags
- Add new customers
  - Objstore.Bucket interface
  - ForeachStore
  - TestObjStoreAcceptanceTest
  - Bucketcfggen
- S3
- AWS policies
- Azur
- OpenStack Swift
- Tencent COS
- AliYun OSS

Thanos case study

- Thanos + Kvass
- Large Kubernetes clusters
  - Kubelet
  - Cadvisor
  - Kube-state-metrics
  - Node-exporter

Multi-cluster surveillance with Thanos

- Prometheus Kubernetes stack
  - AlertManager
  - Grafana
  - Metric storage costs
- Add Pormetheus endpoints as Datasource on Grafana
- Mutual TLS
- Remote writing

MetricFire

- Powerful, scalable Prometheus monitoring
  - Remote storage for the long term
  - Secure transport
  - Easy integration with Prometheus
- Monitoring with Graphite
  - Support for tagged metrics
  - Support for tagged metrics

Companies concerned
This course is aimed at both individuals and companies, large or small,

wishing to train its teams in a new advanced IT technology, or to acquire specific business knowledge or modern methods.

Teaching methods

Practical course: 60% Practical, 40% Theory. Training material distributed in digital format to all participants.

Organization

The course alternates theoretical input from the trainer, supported by examples, with brainstorming sessions and group work.

Validation

At the end of the session, a multiple-choice questionnaire verifies the correct acquisition of skills.

Sanction

A certificate will be issued to each trainee who completes the course.