Monitoring Workshop

Speck&Tech Retreat v2 - 20 October 2019

Who am I?

Specker since 2016

Software Engineer @ Bending Spoons

Ex Student @ UniTN

Ex Software Engineer @ FBK

dp@bendingspoons.com

Introduction

What is monitoring?

Monitoring in the art of knowing, precisely and in real-time, if a system is running correctly in production. A well-implemented monitoring solution allows to:

- Find problems before they affect the users
- Find the root cause of performance issues, outages, and disruptions
- Automatically detect anomalies

Grafana

Analytics platform that allows you to query, visualize, alert on, and understand your metrics. It enables developers to create, explore, and share dashboards with plots and visualizations of data stored in many different data sources.

Prometheus

Open-source system monitoring and alerting toolkit originally built at SoundCloud. It has two main components:

- Prometheus server, which scrapes and stores time-series data
- Client libraries, for instrumenting application code

Counter

A cumulative metric that represents a single monotonically increasing counter whose value can only increase (or be reset to zero on restart).

Examples:

- Number of requests served
- Tasks completed
- Errors

Gauge

Metric that represents a single numerical value that can arbitrarily go up and down.

Examples:

- Temperature
- Current memory usage
- Number of items in the database

Histogram

Sample observations (things like durations or sizes), count them in configurable buckets and provides a sum of all observed values.

Examples:

- Network latency
- Query execution time
- Expensive operation duration

Coding Time!
(almost...)

Your Task

Instrument a simple Python backend 😎

1. Count the number of HTTP calls handled by Flask.
2. Measure the execution time of the different database operations.
3. Register a custom collector to export the count of Todos in the database broken down by status (active vs. inactive).

More details in the **README.md** in the **backend** folder 😉

Check your metrics in Grafana at: http://localhost:3000

Instrumenting with Prometheus

```
c = Counter(
    namespace="app",
    subsystem="flask",
    name="http_request",
    unit="total",
    documentation="...",
    labelnames=("a", "b"),
)

[...]

c.labels(a=2, b="specks").inc()
```

```
h = Histogram(
    namespace="app",
    subsystem="repository",
    name="query_duration",
    unit="seconds",
    documentation="...",
    labelnames=("x",),
)

[...]

with h.labels(x="some").time():
    doQuery()
```

Coding Time!
(...now for real)

References

- Grafana: https://grafana.com/
- Prometheus: https://prometheus.io
- Prometheus Python Client: https://github.com/prometheus/client_python
- Book: Prometheus: Up & Running
- Repo:

  https://github.com/davidepedranz/speck-and-tech-monitoring-workshop

Questions?