Metryki RED dla aplikacji REST z Prometheus + AlertManagera

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WOJCIECH BARCZYŃSKI

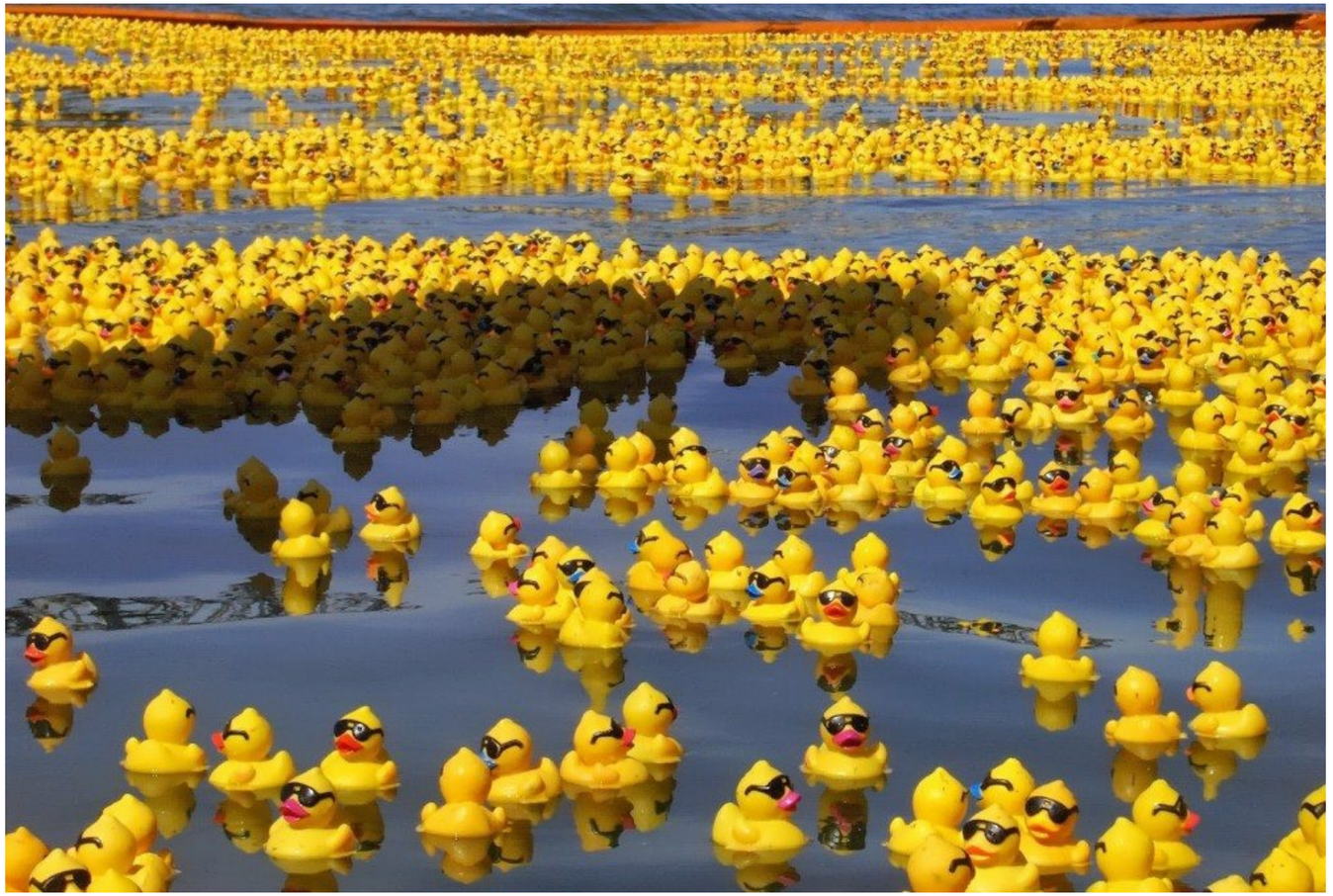
- Senior Software Engineer - SMACC (FinTech/AI)
- Before:
  System Engineer Lyke
- Before:
  1000+ nodes, 20 data centers with Openstack
- Interests:
  Working software
- Hobby:
  teaching software engineering

WHY?

MONOLIT ;)

WHY?

MICROSERVICES ;)



CENTRALIZED LOGGING

- Usually much too late
- Post-mortem
- Hard to find the needle
- Like a debugging

MONITORING

- Liczby
- Trendy
- Zależności

MONITORING

Example from couchbase blog

JAK ZNALEŹĆ WŁAŚCIWE METRYKI?

- USE
- RED

USE

- **u**tilization
- **s**aturation
- **e**rrors

See http://www.brendangregg.com/usemethod.html

USE

- **utilization**: as a percent over a time interval. eg, "one disk is running at 90% utilization".
- **saturation**:
- **errors**:

See http://www.brendangregg.com/usemethod.html

USE

- **utilization**:
- **saturation**: as a queue length. eg, "the CPUs have an average run queue length of four".
- **errors**:

See http://www.brendangregg.com/usemethod.html

USE

- **utilization**:
- **saturation**:
- **errors**: scalar counts. eg, "this network interface drops packages".

See http://www.brendangregg.com/usemethod.html

USE

- **traditionaly** more instance oriented
- still useful in the microservices world

See http://www.brendangregg.com/usemethod.html

RED

- **r**ate
- **e**rror (rate)
- **d**uration (distribution)

Service oriented

RED

- **rate** - how many request per seconds handled
- **error**
- **duration** (distribution)

RED

- **rate**
- **error** - how many request per seconds handled we failed
- **duration**

RED

- **rate**
- **error**
- **duration** - how long the requests took

RED

- Follow Four Golden Signals by Google SREs [1]
- Focus on what matters for end-users

[1] Latency, Traffic, Errors, Saturation (src)

NOTICE

- not recommended for batch-oriented or streaming services

MY WEAPONS OF CHOICE

- Prometheus
- Alertmanager
- Grafana
- Not covered here: OpsGenie, StatusCake

PROMETHEUS

- wide support for languages
- metrics collected over HTTP *metrics/*
- metrics in text

PROMETHEUS

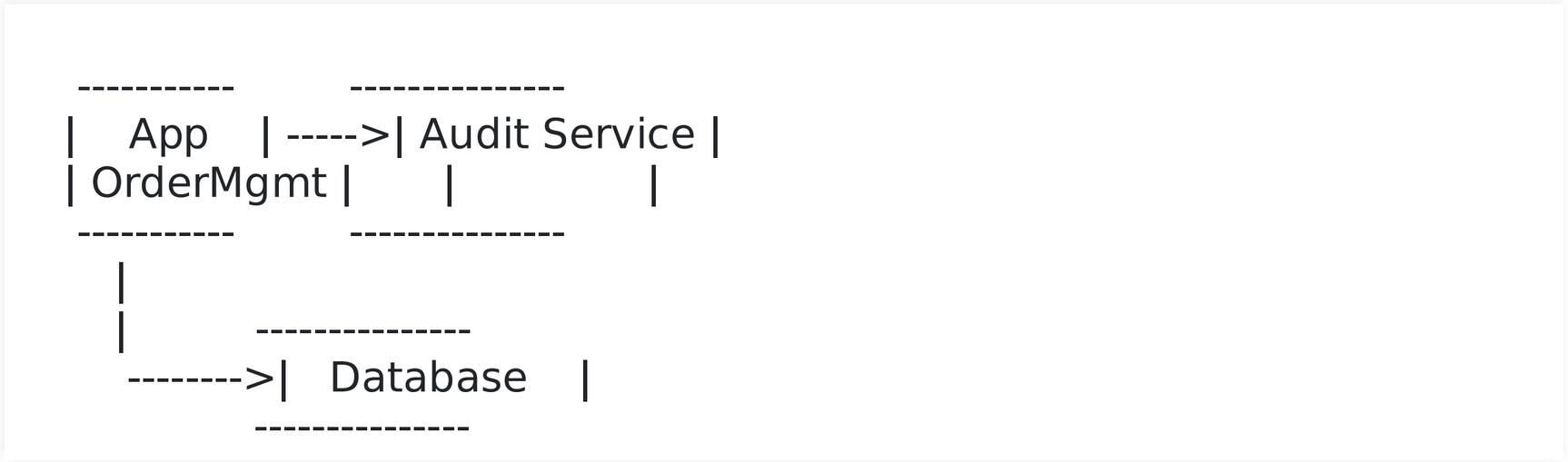
- Easy semantic
- Large number of prometheus exporters
- Focus on low TCO and simplicity
- Powerful query and alarm rule language
- Pull model [1]

[1] I prefer it

METRIC TYPES

- Counter - just up
- Gauge - up/down
- Histogram - samples observation (*sum* + *count* with *buckets* with *count*)
- Summary - (*sum* + *count* with *buckets* with *sum*)

SIMPLE REST SERVICE



SIMPLE REST SERVICE

```
curl 127.0.0.1:8080/hello
curl 127.0.0.1:8080/world
curl 127.0.0.1:8080/complex
```

SIMPLE REST SERVICE

```
curl 127.0.0.1:8080/complex?is_srv_error=True
curl 127.0.0.1:8080/complex?is_db_error=True
curl 127.0.0.1:8080/complex?db_sleep=3&srv_sleep=2
```

OPERATION ENDPOINTS

`metrics/`

Omited:

- *health/*
- *info/*
- *alertrules/*

GOLANG CLIENT

- https://github.com/prometheus/client_golang

DEMO: CODE

- Metric definition
- Metric collection
- Exposing metrics `metrics/`

DEMO: PROM STACK

- Prometheus dashboard and config
- AlertManager dashboard and config
- Simulate the successful and failed calls
- Simple Queries for rate

PROMETHEUS

```
sum(irate(order_mgmt_duration_seconds_count{job=~".*"}[1m]))
  by (status_code)
```

PROMETHEUS

```
order_mgmt_duration_seconds_sum{job=~".*"} or
order_mgmt_database_duration_seconds_sum{job=~".*"} or
order_mgmt_audit_duration_seconds_sum{job=~".*"}
```

METRIC NAMES

Which one is better?

- request_duration{app=my_app}
- my_app_request_duration

METRIC NAMES

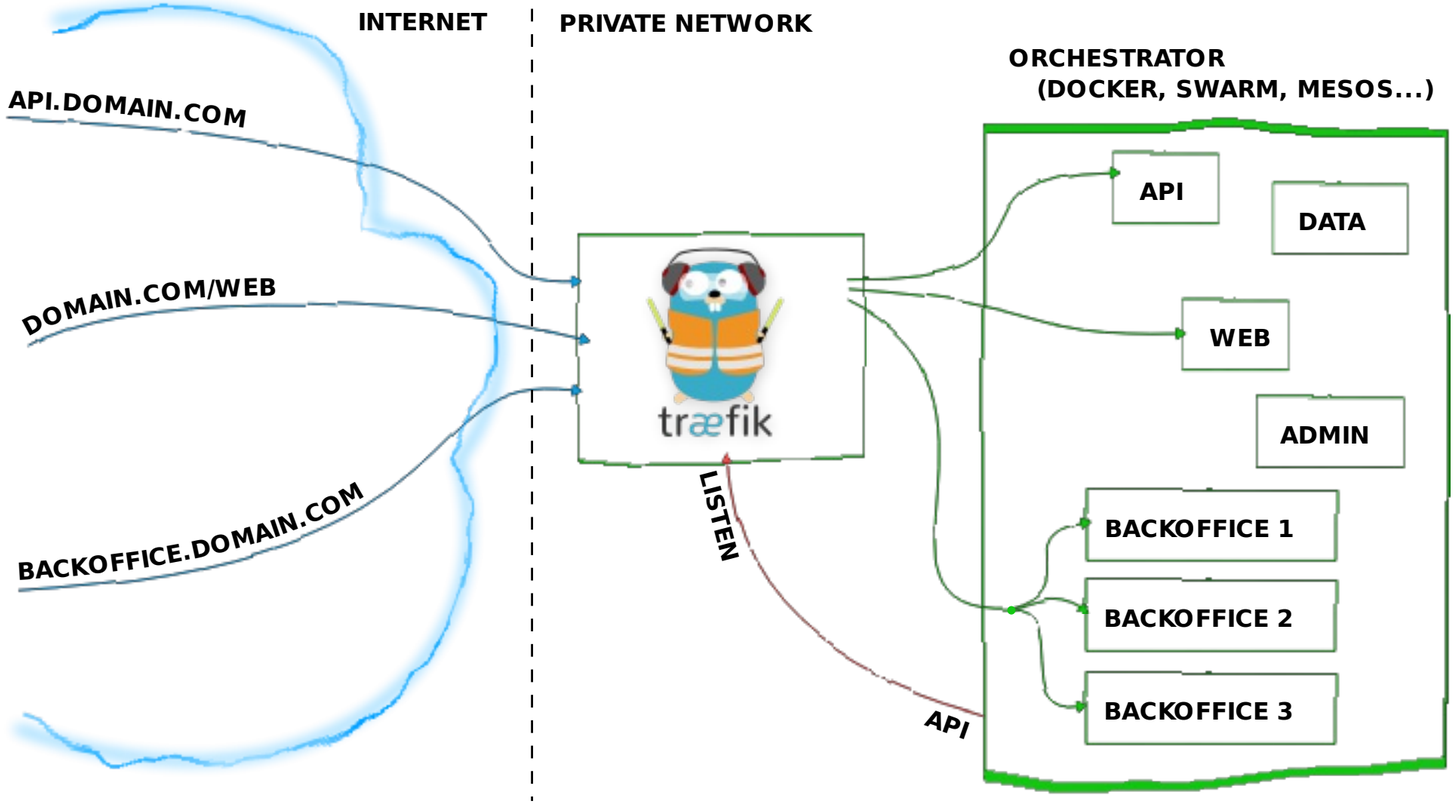
Which one is better?

- order_mgmt_db_duration_seconds_sum
- order_mgmt_duration_seconds_sum{dep_name='db'}

PROMETHEUS EXPORTERS

- Mongodb
- Postresql
- ...

MONITORING INGRESS



- --web.metrics.prometheus

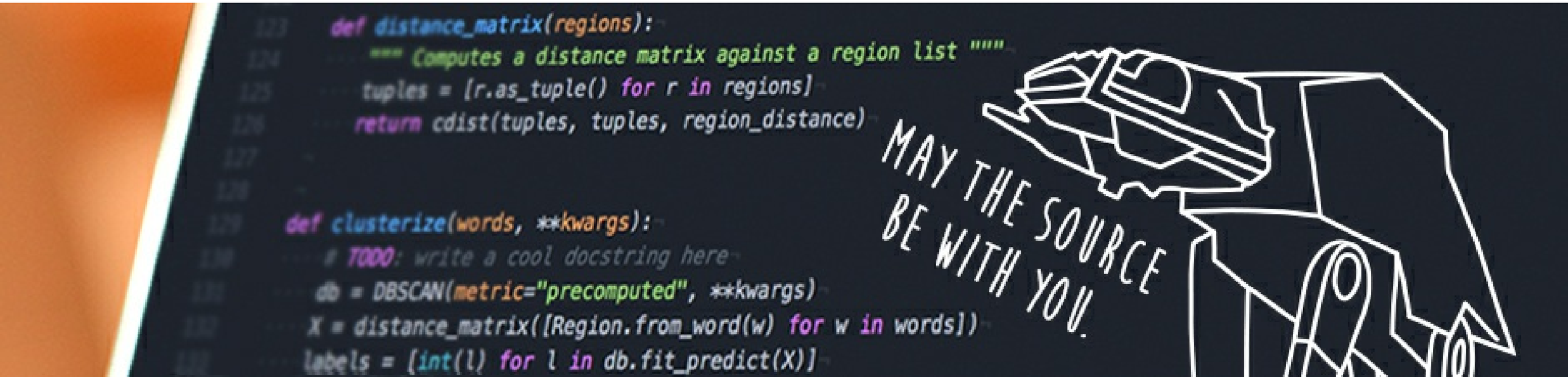
NEXT STEPS

- Extend the sample application with OpenZipkin
- In daily work, evaluating new: linkerd.io, istio.io, ...

SUMMARY

- Monitoring saves your time
- Checking logs **Kibana** to check whether your component works is like debuging vs having tests
- Logging -> high TCO

BACKUP SLIDES



USE LABELS IN ALERT RULES

```
ALERT ProductionAppServiceInstanceDown
  IF up { environment = "production", app =~ ".+"} == 0
  FOR 4m
  ANNOTATIONS {
      summary = "Instance of {{$labels.app}} is down",
      description = " Instance  {{$labels.instance}} of app {{$labels.app}}
  }
```

see ../src/prometheus/etc/alert.rules

USE LABELS IN ALERT ROUTING

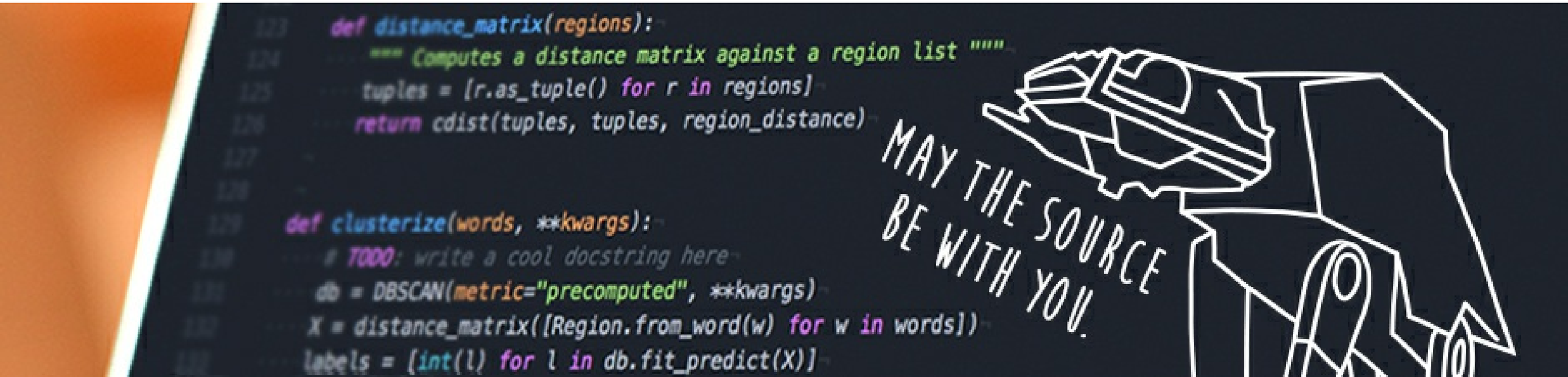
Call somebody if the label is `severity=page`:

```
---
 group_by: [cluster]
 # If an alert isn't caught by a route, send it to the pager.
 receiver: team-pager
 routes:
  - match:
      severity: page
    receiver: team-pager

receivers:
- name: team-pager
  opsgenie_configs:
  - api_key: $API_KEY
    teams: example_team
```

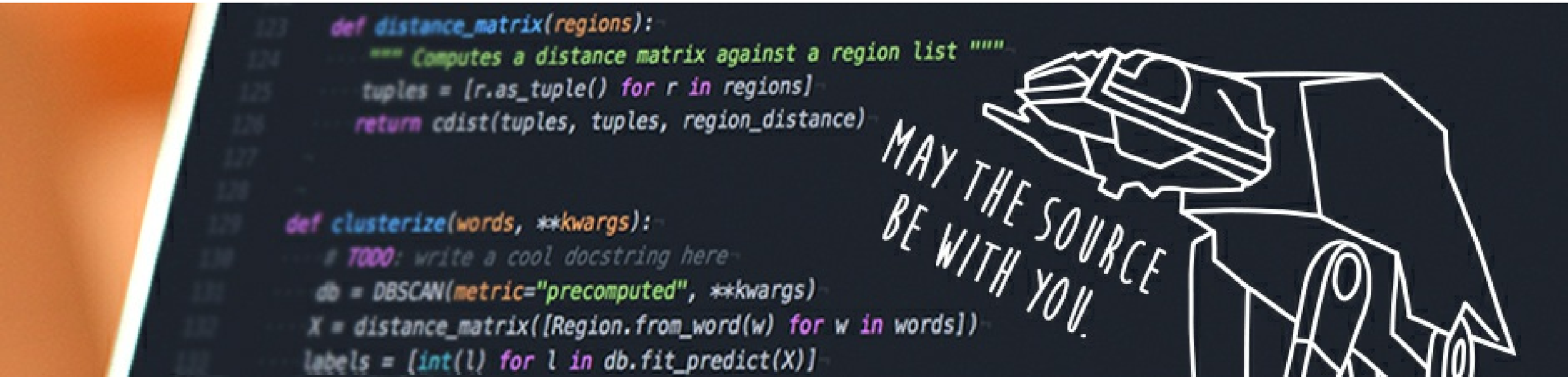
see ../src/alertmanager/*.conf

THANK YOU


def distance_matrix(regions):
"""Computes a distance matrix against a region list"""
tuples = [r.as_tuple() for r in regions]
return cdist(tuples, tuples, region_distance)
def clusterize(words, **kwargs):
# TODO: write a cool docstring here
db = DBSCAN(metric="precomputed", **kwargs)
X = distance_matrix([Region.from_word(w) for w in words])
labels = [int(l) for l in db.fit_predict(X)]
MAY THE SOURCE
BE WITH YOU.

Warsaw Office in BL Astoria:

QUESTIONS?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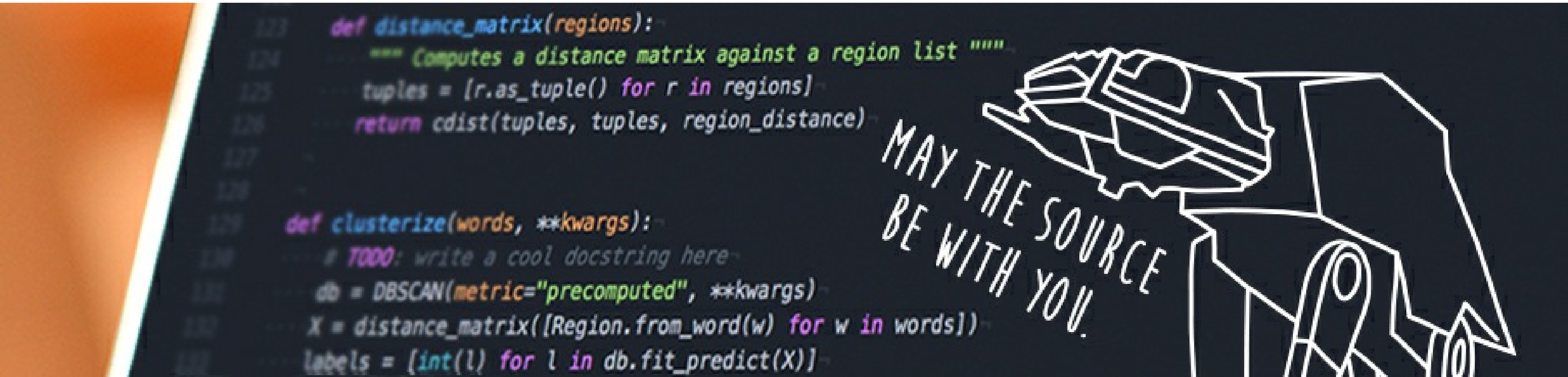

PROMETHEUS + K8S = :)

LABELS ARE PROPAGATED FROM K8S TO PROMETHEUS

INTEGRATION WITH PROMETHEUS

cat memcached-0-service.yaml

```
---
  apiVersion: v1
  kind: Service
  metadata:
    name: memcached-0
    labels:
      app: memcached
      kubernetes.io/name: "memcached"
      role: shard-0
    annotations:
      prometheus.io/scrape: "true"
      prometheus.io/scheme: "http"
      prometheus.io/path: "metrics"
      prometheus.io/port: "9150"
  spec:
```

https://github.com/skarab7/kubernetes-memcached