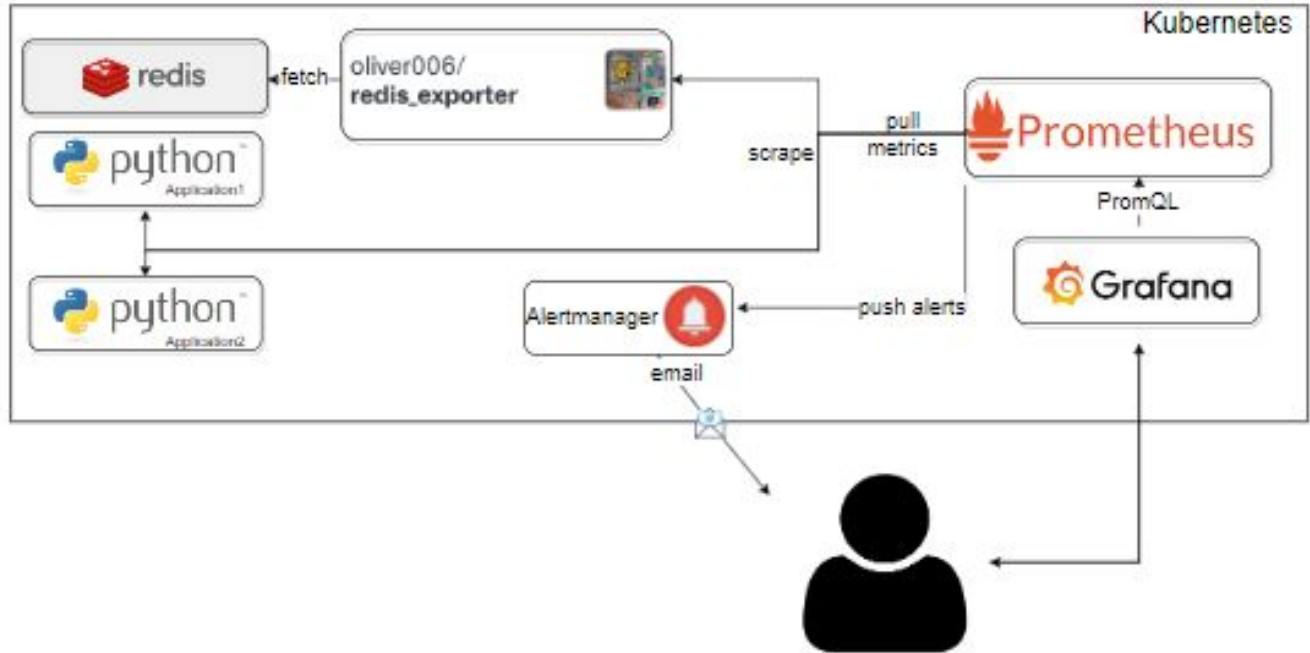# Prometheus, Grafana, Kubernetes

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Architecture

Google Cloud

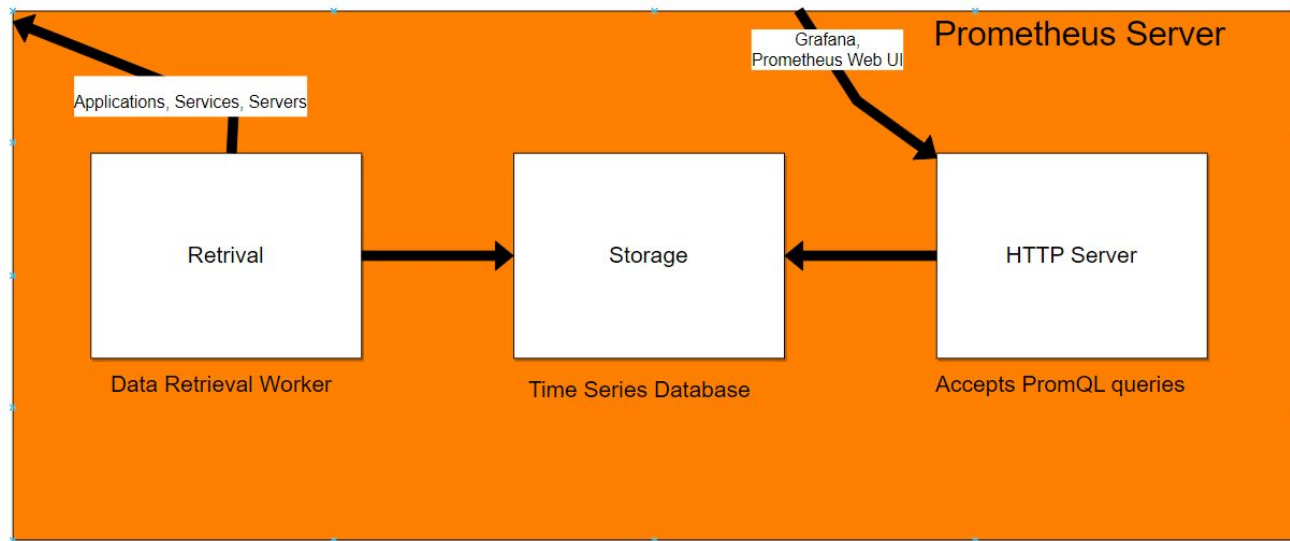|	Name ↑	Status	Type	Endpoints	Pods	Namespace	Clusters
☐	alertmanager	✅ OK	Node port	10.24.3.11:9093 TCP	1/1	monitoring	clc-project-v1
☐	application1-service	✅ OK	Node port	10.24.8.194:8000 TCP	1/1	monitoring	clc-project-v1
☐	application2-service	✅ OK	Node port	10.24.13.106:8001 TCP	1/1	monitoring	clc-project-v1
☐	grafana	✅ OK	Node port	10.24.3.197:3000 TCP	1/1	monitoring	clc-project-v1
☐	node-exporter	✅ OK	Cluster IP	10.24.11.69	1/1	monitoring	clc-project-v1
☐	prometheus-service	✅ OK	Node port	10.24.11.17:8080 TCP	1/1	monitoring	clc-project-v1
☐	redis-exporter-service	✅ OK	Node port	10.24.5.132:9121 TCP	1/1	monitoring	clc-project-v1

Prometheus

Prometheus

Prometheus Server

Applications, Services, Servers

Grafana,
Prometheus Web UI

Retrival

Data Retrieval Worker

Storage

Time Series Database

HTTP Server

Accepts PromQL queries

Screenshots: Prometheus

Python and Prometheus

Prometheus

prometheus-client 0.15.0

pip install prometheus-client

```python
# Create a metric to track time spent and requests made.
request_time = Histogram(
    'request_processing_seconds',
    'Time spent processing request'
)


@app.route('/delay')
@app.route('/delay/<delay_s>')
@number_of_value_errors.count_exceptions(ValueError)
@request_time.time()
def delayed_response(delay_s: int = 0):
    time1 = datetime.now()
    delay_s = int(delay_s) # throws ValueError when parsing non int literals

    delay_s = max(0, delay_s)
    time.sleep(delay_s)
    time2 = datetime.now()
    return jsonify({
            "Starttime" : time1,
             "Endtime":  time2
        })
```

Redis and Prometheus


```
clc3-prometheusgrafana > redis > ! deployment.yaml
1    apiVersion: apps/v1
2    kind: Deployment
3    metadata:
4      namespace: monitoring
5      name: redis
6    spec:
7      replicas: 1
8      selector:
9        matchLabels:
10         app: redis
11     template:
12       metadata:
13         annotations:
14           prometheus.io/scrape: "true"
15           prometheus.io/port: "9121"
16         labels:
17           app: redis
18       spec:
19         containers:
20         - name: redis
21           image: redis:4
22           resources:
23             requests:
24               cpu: 100m
25               memory: 100Mi
26           ports:
27           - containerPort: 6379
28         - name: redis-exporter
29           image: oliver006/redis_exporter:latest
30           securityContext:
31             runAsUser: 59000
32             runAsGroup: 59000
33             allowPrivilegeEscalation: false
34             capabilities:
35               drop:
36               - ALL
37           resources:
38             requests:
39               cpu: 100m
40               memory: 100Mi
41           ports:
```

```
Eingabeaufforderung - kubectl exec -i -t redis-ddb6bb77c-wvrzj -n monitoring --container redis -- redis-cli
127.0.0.1:6379> KEYS *
1) "test:1"
2) "test:3"
3) "test:4"
4) "test:0"
5) "test:2"
127.0.0.1:6379>
```
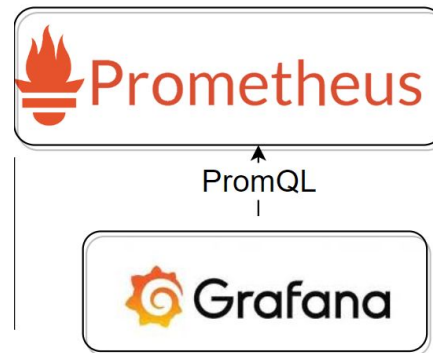
Grafana

Alertmanager

```yaml
kind: ConfigMap
apiVersion: v1
metadata:
  name: alertmanager-config
  namespace: monitoring
data:
  config.yml: |-
    global:
    templates:
    - '/etc/alertmanager/*.tmpl'
    route:
      receiver: alert-emailer
      group_by: ['alertname', 'priority']
      group_wait: 10s
      repeat_interval: 30m
    receivers:
    - name: alert-emailer
      email_configs:
      - to: 'receiver_mail_id@gmail.com'
        from: 'reyna2@ethereal.email'
        smarthost: smtp.ethereal.email:587
        auth_username: 'reyna2@ethereal.email'
        auth_identity: 'reyna2@ethereal.email'
        auth_password: TOP SECRET!!!
```

Subject: [FIRING:1] service_down (10.20.0.17:8001 kubernetes-service-endpoints application2-service monitoring page)
From: <ari.moen@ethereal.email>
To: <receiver_mail_id@gmail.com>
Time: Today at 17:55
Message-ID: <1675011342366256746.6810513630205153405@alertmanager-b7bc8b6cc-vv6hk>

◉ HTML ○ Plaintext

1 alert for alertname=service_down

View In Alertmanager

[1] Firing

Labels
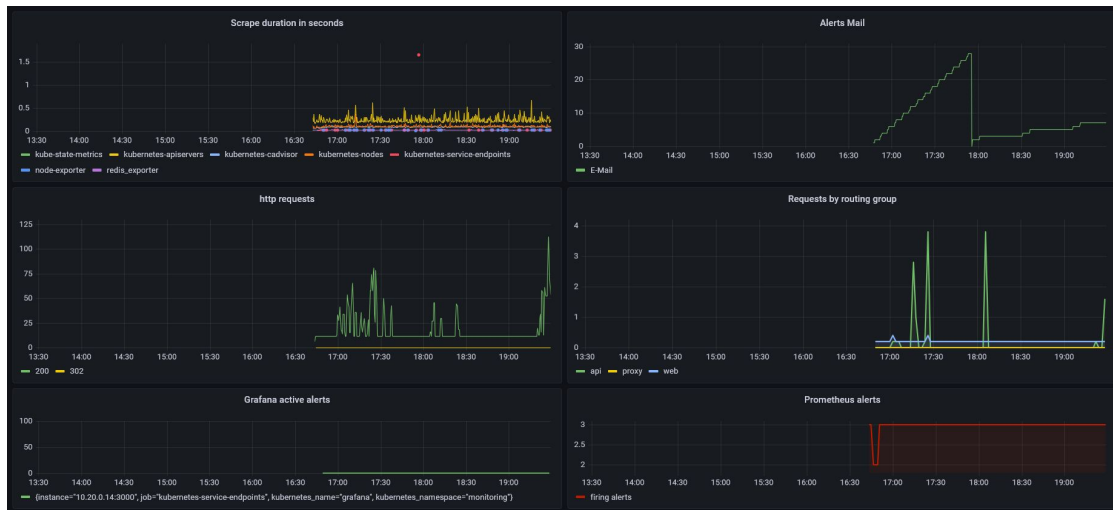alertname = service_down
instance = 10.20.0.17:8001
job = kubernetes-service-endpoints
kubernetes_name = application2-service
kubernetes_namespace = monitoring
severity = page
Annotations
description = 10.20.0.17:8001 of job kubernetes-service-endpoints has been down for more than 2 minutes.
summary = Instance 10.20.0.17:8001 down
Source

Sent by Alertmanager

9
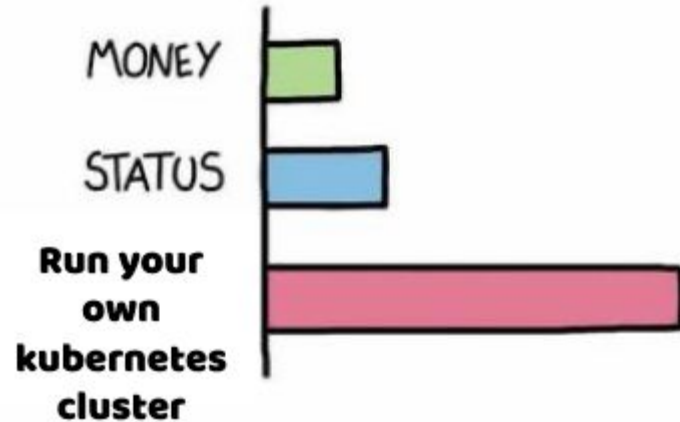
Live Demo

Lessons Learned

- 10.000 Milliseconds ≠ 10.000 seconds
- It is more difficult to add in existing architecture then building a new one
- PowerShell makes it easier
- Good Documentation helps for setting up new Deployment
- Dashboards don't have to be made from scratch
- Also with tutorials, exporter are not always easy to include

WHAT GIVES PEOPLE FEELINGS OF POWER

MONEY

STATUS

Run your own kubernetes cluster

@iamnotmarkist

Q & A