



Prometheus



Grafana



kubernetes

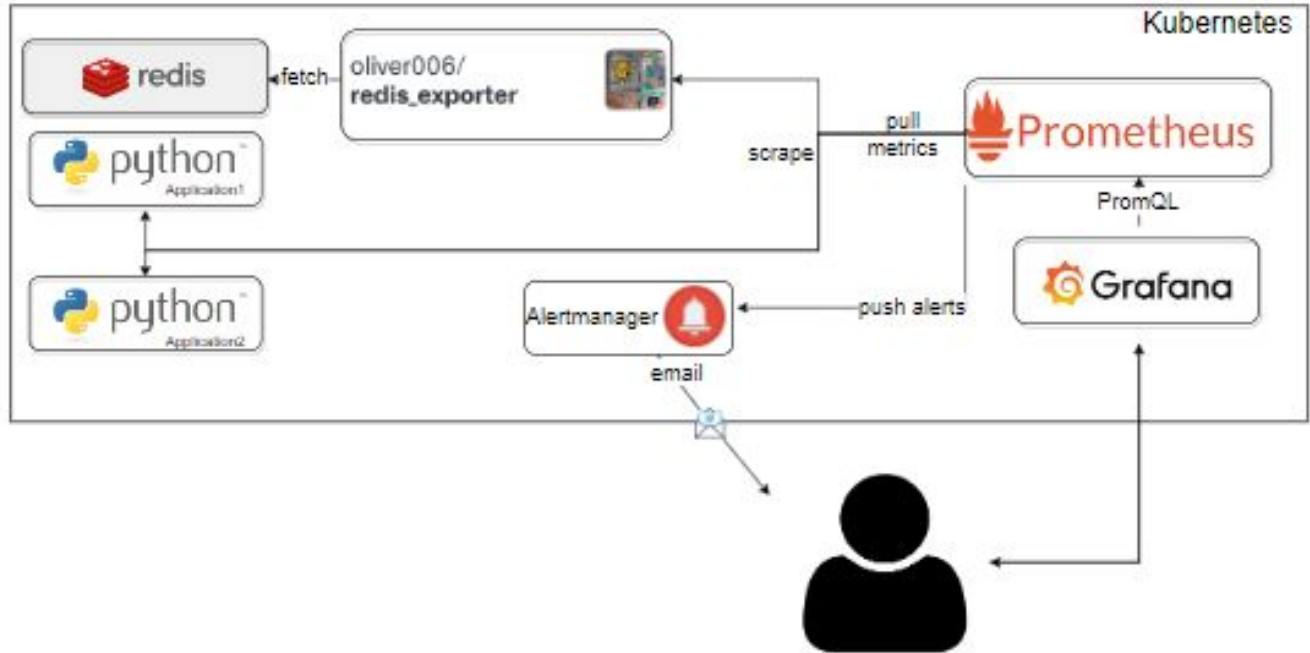
# Prometheus, Grafana, Kubernetes

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# Architecture

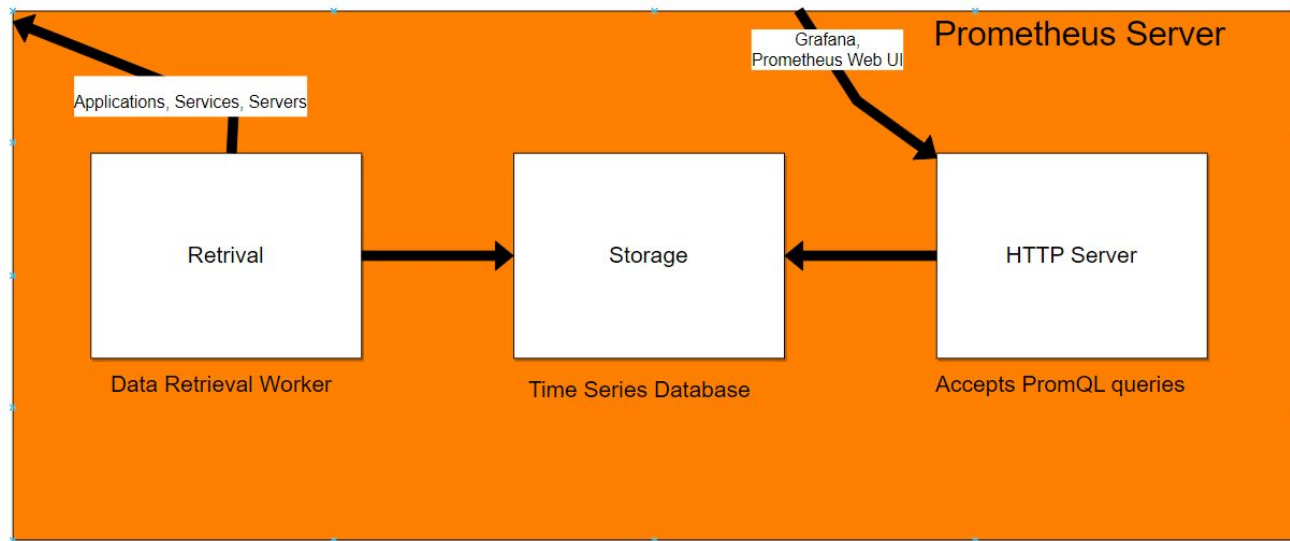
Google Cloud



# Google Cloud

<input type="checkbox"/>	Name ↑	Status	Type	Endpoints	Pods	Namespace	Clusters
<input type="checkbox"/>	<a href="#">alertmanager</a>	✓ OK	Node port	10.24.3.11:9093 TCP	1/1	monitoring	<a href="#">clc-project-v1</a>
<input type="checkbox"/>	<a href="#">application1-service</a>	✓ OK	Node port	10.24.8.194:8000 TCP	1/1	monitoring	<a href="#">clc-project-v1</a>
<input type="checkbox"/>	<a href="#">application2-service</a>	✓ OK	Node port	10.24.13.106:8001 TCP	1/1	monitoring	<a href="#">clc-project-v1</a>
<input type="checkbox"/>	<a href="#">grafana</a>	✓ OK	Node port	10.24.3.197:3000 TCP	1/1	monitoring	<a href="#">clc-project-v1</a>
<input type="checkbox"/>	<a href="#">node-exporter</a>	✓ OK	Cluster IP	10.24.11.69	1/1	monitoring	<a href="#">clc-project-v1</a>
<input type="checkbox"/>	<a href="#">prometheus-service</a>	✓ OK	Node port	10.24.11.17:8080 TCP	1/1	monitoring	<a href="#">clc-project-v1</a>
<input type="checkbox"/>	<a href="#">redis-exporter-service</a>	✓ OK	Node port	10.24.5.132:9121 TCP	1/1	monitoring	<a href="#">clc-project-v1</a>

# Prometheus



## Screenshots: Prometheus

```

1  apiVersion: v1
2  kind: ConfigMap
3  metadata:
4    name: prometheus-server-conf
5    labels:
6      name: prometheus-server-conf
7    namespace: monitoring
8  data:
9    prometheus.rules: |-
10     groups:
11     - name: devopscube demo alert
12       rules:
13         # Alert for any instance that is unreachable for >2 minutes.
14         - alert: service_down
15           expr: up == 0
16           for: 2m
17           labels:
18             severity: page
19           annotations:
20             summary: "Instance {{ $labels.instance }} down"
21             description: "{{ $labels.instance }} of job {{ $labels.job }} has been down for more than 2 minutes."
22         - alert: High Pod Memory
23           expr: sum(container_memory_usage_bytes) > 1
24           for: 1m
25           labels:
26             severity: slack
27           annotations:
28             summary: High Memory Usage
29    prometheus.yml: |-
30     global:
31       scrape_interval: 5s
32       evaluation_interval: 5s
33     rule_files:
34       - /etc/prometheus/prometheus.rules
35     alerting:
36       alertmanagers:
37         - scheme: http
38           static_configs:
39             - targets:
40               - "alertmanager.monitoring.svc:9093"

```

```
① README.md | config-map.yaml X deployment.yaml
```

```
cd3-prometheusgrafana > ! config-map.yaml  
40 | cat <<cat>> -> curl -X GET http://localhost:9090/  
41 scrape_configs:  
42   - job_name: 'node-exporter'  
43     kubernetes_sd_configs:  
44       - role: endpoints  
45     relabel_configs:  
46       - source_labels: [__meta_kubernetes_endpoints_name]  
47         regex: 'node-exporter'  
48         action: keep  
49  
50   - job_name: 'kube-state-metrics'  
51 static_configs:  
52   - targets: ['kube-state-metrics.kube-system.svc.cluster.local:8080']  
53  
54   - job_name: 'kubernetes-apiservers'  
55     kubernetes_sd_configs:  
56       - role: endpoints  
57     scheme: https  
58     tls_config:  
59       ca_file: /var/run/secrets/kubernetes.io/serviceaccount/ca.crt  
60       bearer_token_file: /var/run/secrets/kubernetes.io/serviceaccount/token  
61     relabel_configs:  
62       - source_labels: [__meta_kubernetes_namespace, __meta_kubernetes_service_name, __meta_kubernetes_endpoint_port_name]  
63         action: keep  
64       regex: default;kubernetes;https  
65  
66   - job_name: 'kubernetes-nodes'  
67     scheme: https  
68     tls_config:  
69       ca_file: /var/run/secrets/kubernetes.io/serviceaccount/ca.crt  
70       bearer_token_file: /var/run/secrets/kubernetes.io/serviceaccount/token  
71     kubernetes_sd_configs:  
72       - role: node  
73     relabel_configs:  
74       - action: labelmap  
75       - regex: __meta_kubernetes_node_label_(.+)  
76       - target_label: __address__  
77       - replacement: kube-kubernetes.default.svc:443  
78     source_labels: [__meta_kubernetes_node_name]  
79     regex: (.+)  
80     target_label: __metrics_path__
```



Prometheus

prometheus-client 0.15.0

pip install prometheus-client

# Python and Prometheus

```
# 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



```
🖥 Eingabeaufforderung - kubect exec -i -t redis-dbb6b77c-wvrzj -n monitoring --container redis -- redis-cli
```

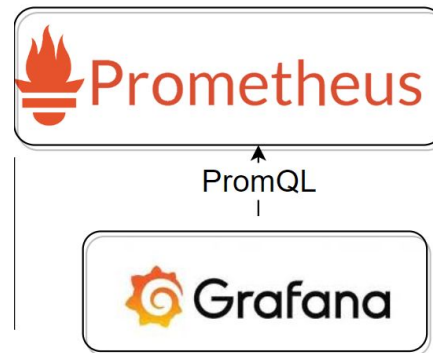
```
127.0.0.1:6379> KEYS *  
1) "test:1"  
2) "test:3"  
3) "test:4"  
4) "test:0"  
5) "test:2"  
127.0.0.1:6379>
```

```
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:
```

# Grafana



```
README.md config-map.yaml service.yaml x
clc3-prometheusgrafana > kubernetes-grafana > ! service.yaml
1  apiVersion: v1
2  kind: Service
3  metadata:
4    name: grafana
5    namespace: monitoring
6    annotations:
7      | prometheus.io/scrape: 'true'
8      | prometheus.io/port: '3000'
9  spec:
10   selector:
11     app: grafana
12   type: NodePort
13   ports:
14     - port: 3000
15       targetPort: 3000
16       nodePort: 32000
```





# Alertmanager

```
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

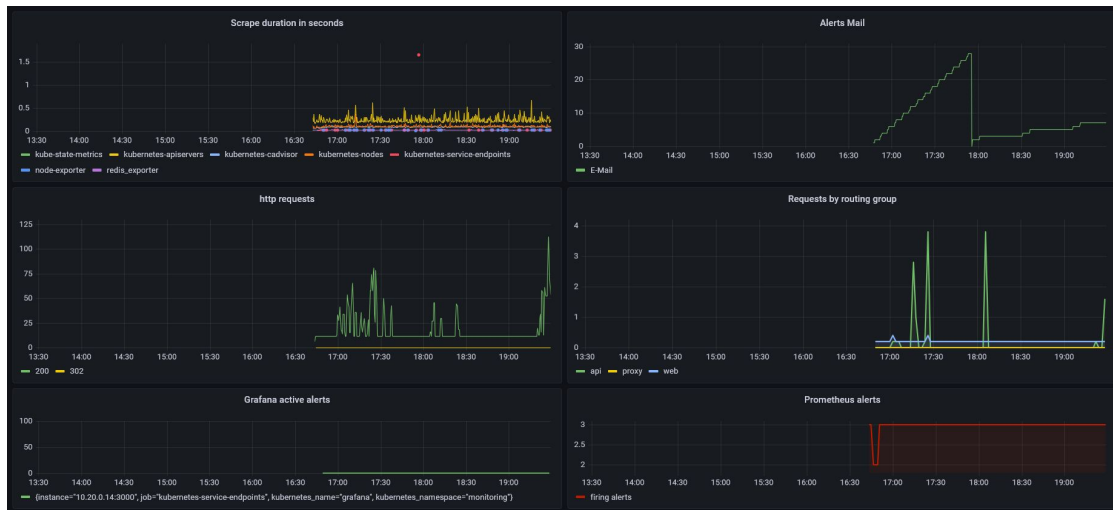
alertname = service\_down  
instance = 10.20.0.17:8001  
job = kubernetes-service-endpoints  
kubernetes\_name = application2-service  
kubernetes\_namespace = monitoring  
severity = page

### 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](#)

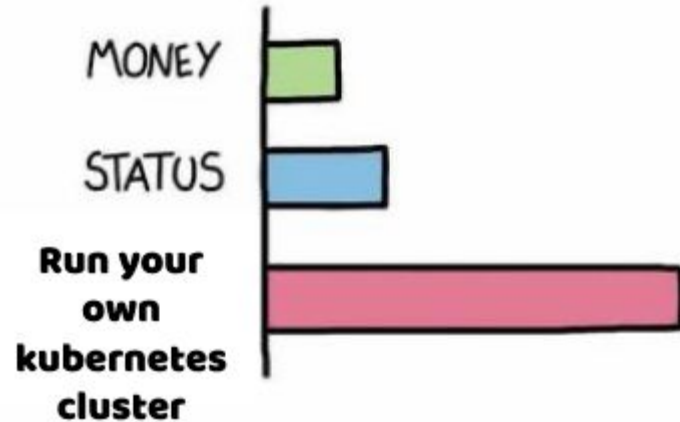
# Live Demo



## Lessons Learned

- 10.000 Milliseconds  $\neq$  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



@iamnotanerd

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## Q & A

