Monitoring Kubernetes with OMD Labs Edition and Prometheus

Michael Kraus - FOSDEM 2017
About me
About me

Michael Kraus

Senior Monitoring Consultant @ ConSol.

Doing monitoring for 12 years, mainly with plain old Nagios, open-source only.
Background
Why

Kubernetes in a classical enterprise

Implementation of Kubernetes PoC at $customer:

We have...

- already running some monitoring instances there.
- but no idea about monitoring Kubernetes.
With

Enter Prometheus

Natural choice for kubernetes monitoring:

- Integrated service discovery
- Labels are retained between Kubernetes and Prometheus
How

Where to start

There are excellent tutorials and blog posts available as a starting point, for example by

- coreos.com/blog/ (Fabian Reinartz)
- robustperception.io/blog/ (Brian Brazil)
- ... many examples on GitHub
Implementation
Implementation

Prometheus

kubernetes_sd

- kubernetes_sd_configs
  - role: endpoints
- kubernetes_sd_configs
  - role: node
- kubernetes_sd_configs
  - role: pod

prometheus-kubernetes.yml from prometheus/examples.
kubernetes

NODE

NODE

NODE
Implementation

Prometheus kubernetes_sd

Metrics:

- apiserver_*
- container_cpu_*
- container_fs_*
- deployment_*
- etcd_*
- kubelet_*
- ...

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Implementation

node_exporter

Prometheus exporter for hardware and OS metrics exposed by the kernel.

- DaemonSet
- prometheus.io/scrape: 'true'
kubernetes
Implementation

node_exporter

Metrics:

- node_cpu
- node_disk_*
- node_filesystem_*
- node_netstat_*
- node_vmstat_*
- ...

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Implementation

kube-state-metrics

“... focused ... on the health of the various objects inside, such as deployments, nodes and pods.”

● prometheus.io/scrape: 'true'

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Implementation

kube-state-metrics

Metrics:

- kube_deployment_*
- kube_node_*
- kube_pod_*
- kube_resource_quota
- ...
Implementation

Demo environment

Based on minikube:
github.com/kubernetes/minikube

Sample config:
github.com/m-kraus/kubernetes-monitoring
Demo
Implementation

What else?

What we also need:

- persistent storage
- Alertmanager
- Grafana
- Pushgateway
- ...

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But we have that already
Classical monitoring

OMD Labs Edition

Monitoring in one package.

- completely open-source
- based on Nagios / Icinga
- bundles “best practices” of many years of experience
- no root required

"Musterlösung" at $customer for monitoring projects:
Classical monitoring
OMD Labs Edition

Nagios  Icinga1  Icinga2  Shinken
Naemon  Thruk  Mod-Gearman
LMD    NagVis    PNP4Nagios
Apache MySQL InfluxDB Nagflux
Prometheus  Dokuwiki
Grafana  FreeTDS  JMX4Perl
check_webinject  check_logfiles
Jolokia  check_mysql_health
coshsh  check_mssql_health  rrdcache
check_nsc_web  check_curly
check_nwc_health  check_multi
check_oracle_health  Ansible
Classical monitoring
OMD sites and commands

```
omd create <MYSITE>
omd cp <PROD> <STAGE>
omd update <STAGE>
omd version
```
omd create <MYSITE>
omd cp <PROD> <STAGE>
Classical monitoring
OMD Labs Edition

https://labs.consol.de/omd/
Why not scrape Kubernetes directly from OMD:

- hard to access pods inside Kubernetes
- hard to access API from outside Kubernetes
- API secured via TLS and token only (easily) available from a serviceaccount
Getting the metrics from Kubernetes to OMD:

- federation
  - job_name: 'kube_federation'
    metrics_path: '/federate'
    honor_labels: true
    params:
      'match[][]':
        - '{job=~"^kubernetes.+"}'}

Implementation
Connecting OMD
Demo
Issues
Issues

Federation

“... Not quite the purpose of federation.”

Brian Brazil
www.robustperception.io/federation-what-is-it-good-for/

● Let’s try it anyway ...
Issues

Securing

"Accessing metrics without authentication is ok for a PoC, but not allowed in production..."

internal audit

- How to secure (federated) Prometheus?
Issues
Integration

"Should Nagios, Alertmanager or both notify?"

“Do we need to define our checks and alerts both, in Nagios and Prometheus?”

- How to route alerts
- How to ease or centralize configuration
Issues

Long-term storage

“How can we store (some) of our graphs for a longer period of time?”

- InfluxDB?
“Our kubernetes cluster died. We had no monitoring until it up again...”

*operations team*

**Issues**

**Coverage**

- external monitoring of crucial components
  - machine health
  - important services
  - important API queries
Thanks for watching