Kubernetes SIG Instrumentation: Intro and Deep Dive

David Ashpole, *Google, Tech Lead (@dashpole)*

Frederic Branczyk, *Polar Signals, Tech Lead (@brancz)*

Elana Hashman, *Red Hat, Chair (@ehashman)*

Han Kang, *Google, Chair (@logicalhan)*

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Introduction

- What does SIG Instrumentation do?
- Current activities
  - Metrics
  - Logs and Events
  - Traces
  - SIG Subprojects
- How to contribute
- Where to find us
- Related talks!

What do we do?

- **Charter**: To cover best practices for cluster observability across all Kubernetes components and develop relevant components.

- Metrics
- Logs and Events
- Traces

- **Subprojects**:
  - kube-state-metrics
  - klog
  - metrics-server
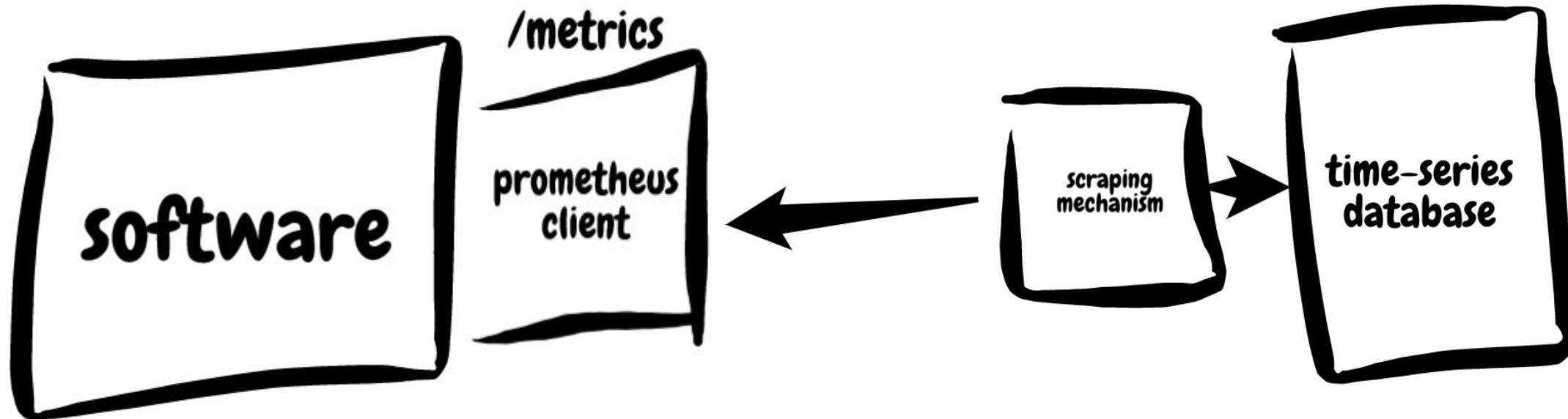 - and more!

How do we do it?

- Triage and fix relevant instrumentation issues
  - [All open SIG Instrumentation-labelled issues and pull requests](#)
- Review all code changes for metrics
- Develop new features and enhancements
  - [Kubernetes Enhancement Proposals (KEPs) for SIG Instrumentation](#)
- Maintain subprojects

Metrics

Kubernetes components integrate with Prometheus, a time-series based monitoring and alerting toolkit.

Brief History

Fix admission metrics in true units #72343

Merged **k8s-ci-robot** merged 2 commits into `kubernetes:master` from `danielqsj:adm` on Jan 28

💬 Conversation 30   ⊶ Commits 2   Checks 0   📄 Files changed 1

danielqsj commented on Dec 26, 2018 • edited ▾   Member +😊 ...

What type of PR is this?

/kind bug

What this PR does / why we need it:

Admission metrics name is `*_admission_latencies_seconds` and `*_admission_latencies_seconds_summary`, the units from metrics name are `seconds`, but actually the return metrics are in `microseconds`, this PR aims to fix these metrics in `seconds`.

service.

	min	max	avg
	757 MiB	5.61 GiB	3.27 GiB	5.06 GiB

SIG Efforts

- **GA:** Metric Overhaul (http://bit.ly/metrics-overhaul)

- **Beta:** Metric Stability Framework (http://bit.ly/stability-kep)

- Road to **Alpha**
  - Pod Resource Metrics (**v1.20**)

  - Dynamic Cardinality Enforcement (**v1.21**)

- **promq**
  - CLI tool for debugging prometheus endpoints (http://bit.ly/promq-tool)

Events API redesign

- Motivation
  - Reduce performance impact of Events on cluster
  - Add more structure to events
- Introduced >3 years ago
- Graduated to GA in 1.19
  - https://github.com/kubernetes/enhancements/blob/master/keps/sig-instrumentation/383-new-event-api-ga-graduation/README.md

Structured Logs

- Introduce structured logging in Kubernetes

- Alpha 1.19

- New klog v2 methods: `klog.InfoS`, `klog.ErrorS`

- Enable with `--logging-format=json`

- Step by step migration, starting with most impactful

- https://kubernetes.io/blog/2020/08/26/kubernetes-release-1.19-accentuate-the-paw-sitive/#structured-logging

Log security

- Hide credentials and secrets from Kubernetes' logs

- Enable with `--logging-sanitization`

- Alpha in 1.20
  - Dynamic Sanitization of logs

  - Static checks

- https://github.com/kubernetes/enhancements/tree/master/keps/sig-instrumentation/1753-logs-sanitization

Traces

Traces

- Introduce Distributed Tracing in Kubernetes

- Trace API Server requests

- Enable with `--opentelemetry-config-file`

- Alpha in 1.20

  - https://github.com/kubernetes/enhancements/tree/master/keps/sig-instrumentation/647-apiserver-tracing

Subprojects

- kube-state-metrics
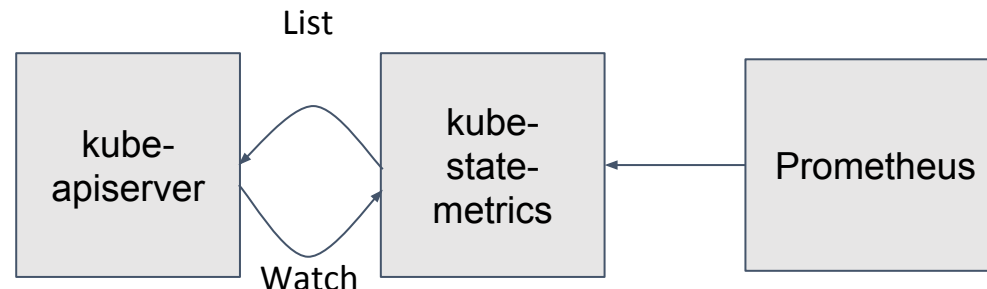
- Metrics Server

- k8s-prometheus-adapter

kube-state-metrics

- Generate Prometheus style metrics from Kubernetes API objects

- Pods, Deployments, StatefulSets, etc.

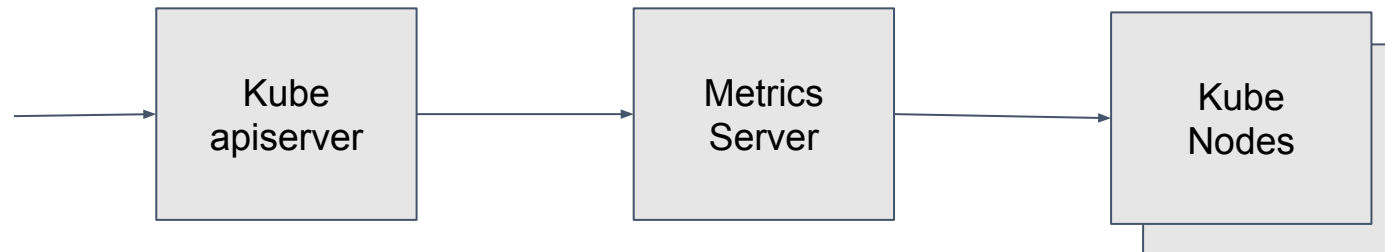- v2 Release coming up (please test pre-releases!)

Example:

```
kube_deployment_spec_replicas
kube_deployment_status_replicas_updated
```

Metrics Server

- Implementation of the resource metrics API
  - Source of `$ kubectl top`
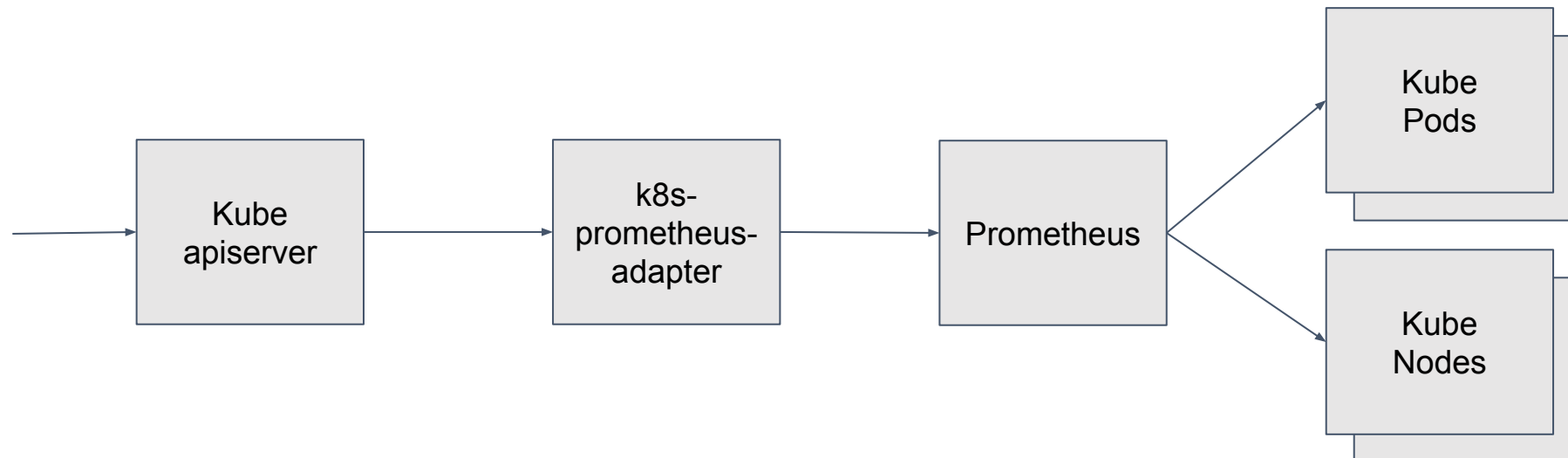 - Source of metrics for resource based autoscaling
- Repo: https://github.com/kubernetes-sigs/metrics-server

k8s-prometheus-adapter

- Implementation of the resource/custom/external metrics API

  - Use custom metrics for autoscaling

- Repo: https://github.com/DirectXMan12/k8s-prometheus-adapter

  - Migration to official repos in progress

Get involved!

How to contribute

- Attend our SIG meetings!

- Participate in reviews, issues, and docs!

- `kube-state-metrics` is seeking new contributors

  - Contact **Lili Cosic** (@lilic)

- `metrics-server` and structured logging implementation are seeking contributors

  - Contact **Marek Siarkowicz** (@serathius)

- `promq` is seeking new contributors

  - Contacts: **Han Kang** (@logicalhan), **Solly Ross** (@directxman12), **Yuchen Zhou** (@YoyinZyc)

Where to find us

- **SIG Meetings:**
  - [Regular meeting](), alternating **biweekly** on **Thursdays at 9:30am Pacific Time**
  - [Triage meeting](), alternating **biweekly** on **Wednesdays at 9am Pacific Time**
- **Slack channel:** [#sig-instrumentation]()
- **Mailing list:** [kubernetes-sig-instrumentation]()
- **Chairs:** @ehashman and @logicalhan
- **Tech leads:** @brancz and @dashpole

Relevant talks

- **Structured Logging in Kubernetes 1.19**
  - Wednesday, Nov. 18 @4:55pm ET

- **CNCF SIG Observability Intro/Deep Dive**
  - Friday, Nov. 20 @4:00pm ET

- **Many others:** watch related content on the Observability and Maintainer tracks