Keptn

Getting app observability to the next stage

May 18, 2022

> whoami

@oleg_nenashev

oleg-nenashev

dynatrace

CD.FOUNDATION

keptn

Dynatrace OSPO

// OSPO - Open Source Programs Office

- Started as Innovation Lab
- Reorganized as the OSPO in 2021
- Driving open source initiatives & strategy
- We help Dynatracers to participate in Open Source - infra, legal, consulting, tooling, community operations, ...

engineering.dynatrace.com/open-source

Dynatrace OSPO. Key projects / areas

CLOUD NATIVE
COMPUTING FOUNDATION

TODO

Outline

- Open Observability 101
- Keptn - acting on observability data
- Keptn usage modes
- (?) Live demo
- Discussion

These slides

Disclaimer

- Opinions are my own, happy to discuss
- My talk does not represent opinions of my employer, the Continuous Delivery Foundation, or the Keptn community
- I present only open source projects today

Site Reliability Engineering (SRE)

https://blog.bullgare.com/2018/05/sre-sla-vs-slo-vs-sli/

ONE DOES NOT SIMPLY DO
SRE

Modern cloud native systems are no longer simple!

- CI/CD
- Production
- Staging

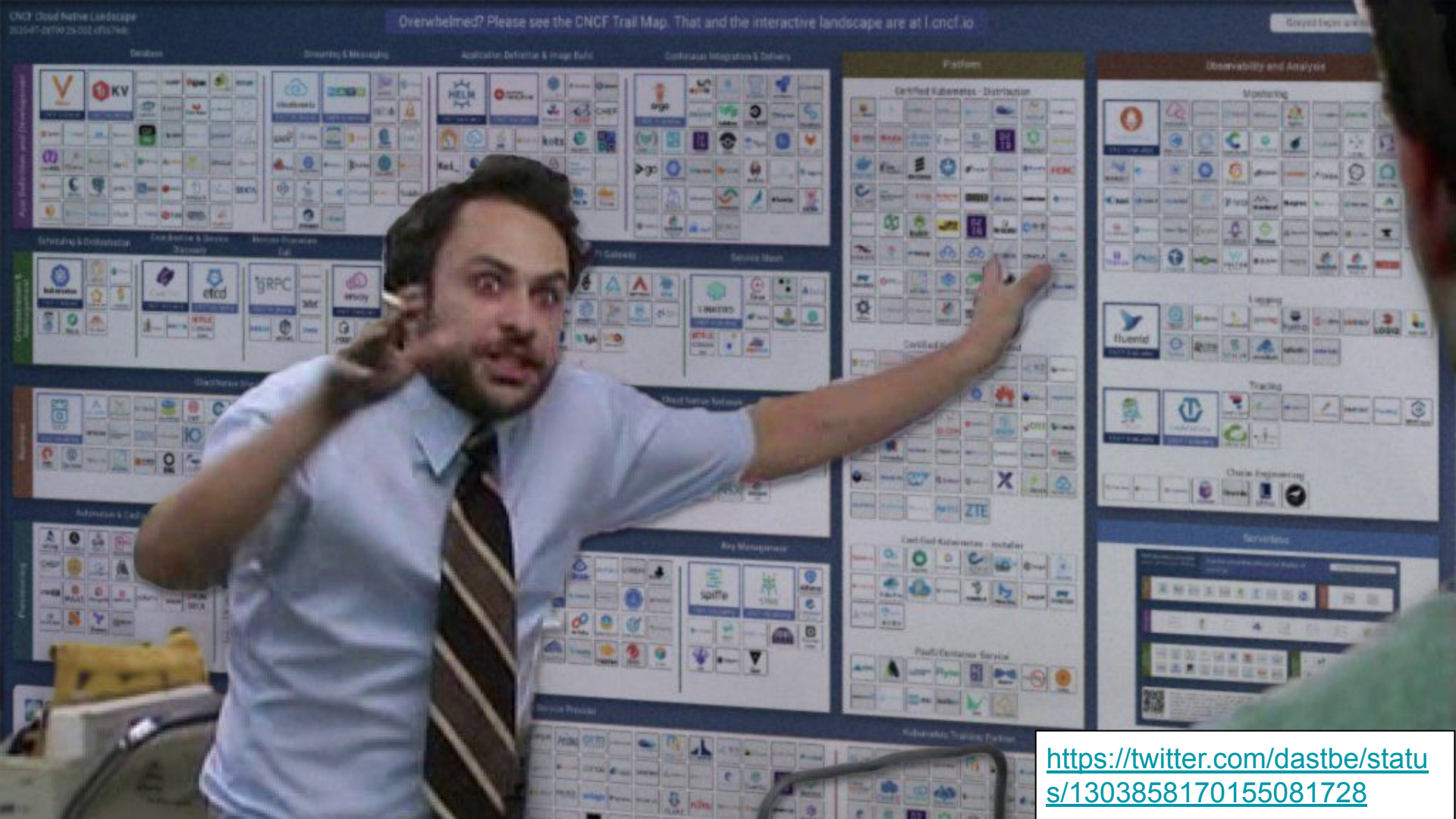
Operations at scale

Spaghetti Automation

- Configuration complexity
- Duplication
- Many parties involved
- Configuration drift

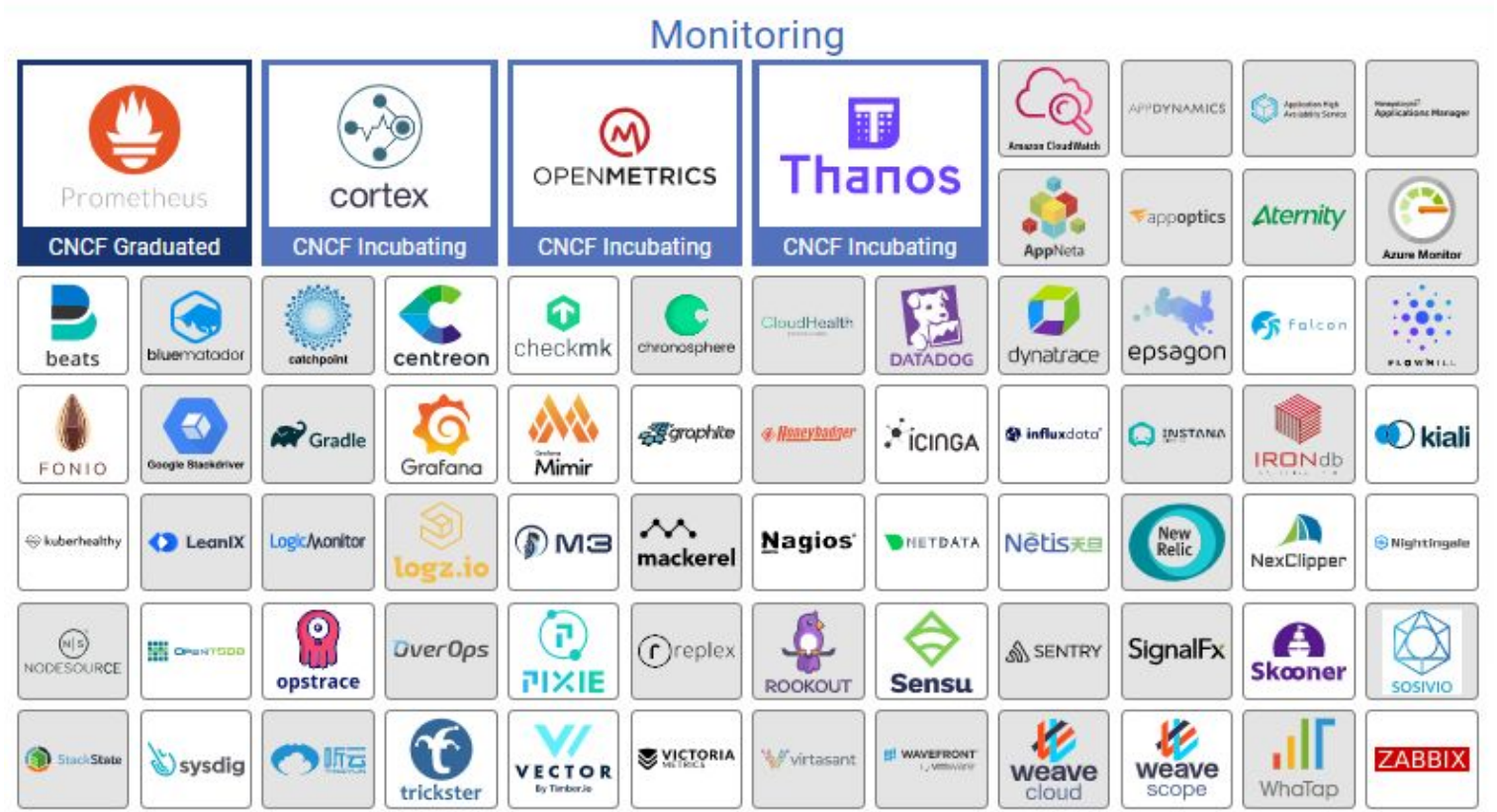
Maintenance is difficult

Is it Observable ?
Observability
is a must
OpenTelemetry



https://twitter.com/dastbe/status/1303858170155081728

Observability and Analysis



https://landscape.cncf.io/

Open Observability Standards

cloudevents

OPEN METRICS

Open Observability Standards… and Implementations

cloudevents

Prometheus

Thanos

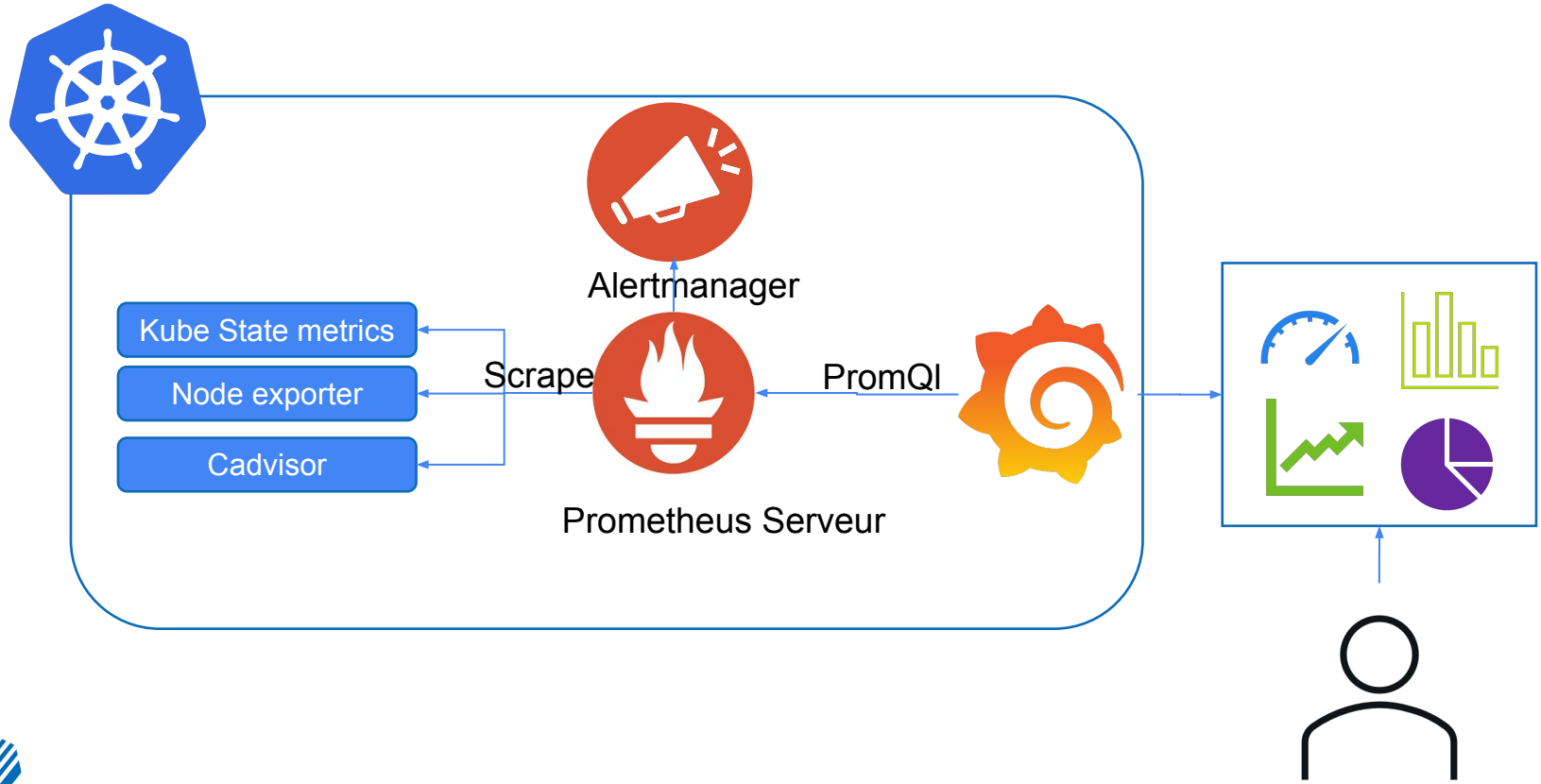
OPEN METRICS

JAEGER

cortex

Grafana

Architecture of Prometheus



TOO MUCH DYNATRACE DATA?
GOOD
memegenerator.net

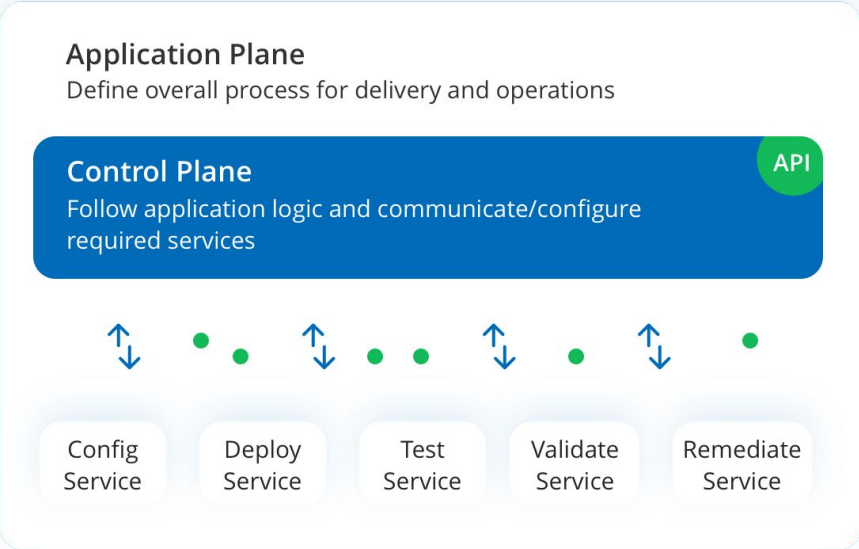
Got Data? Act On It!

Getting Observability to the next stage

With Keptn

Keptn in other words …

Observability-driven orchestration for your **cloud native** apps



https://keptn.sh

Keptn makes SRE easier

Taras Tsugrii • 1st
Software Engineer, Coach, Mentor, Host and Organizer of Performance Summit an...
1mo •

Keptn feels like a reference implementation of Google's "Site Reliability Engineering" and "The Site Reliability Workbook" books, so it's been an absolute pleasure to learn more about it from **Andreas Grabner** himself! I'm looking forward to seeing it establishing standards for such important concepts like SLI, SLO and remediation strategy.

#keptn #continuousdelivery #sre

Keptn

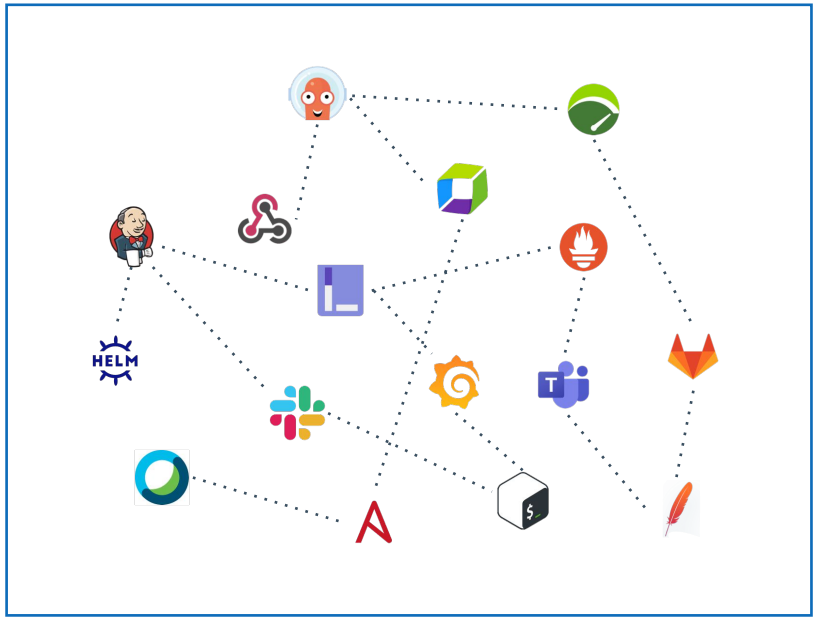
- CNCF Sandbox project
- Control plane, admin frontend/CLI
- Observability, dashboards & alerting
- SLO-driven multistage delivery
- Operations & remediation

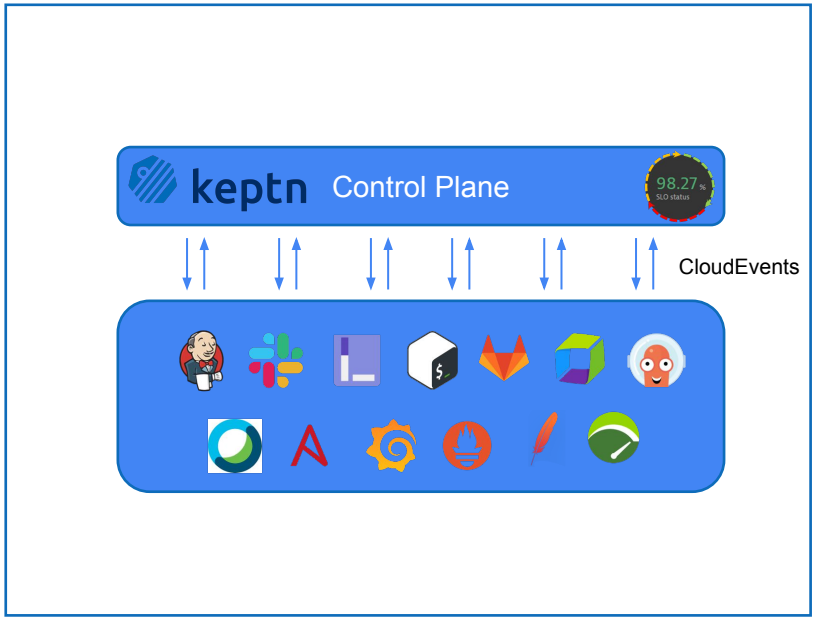
CLOUD NATIVE COMPUTING FOUNDATION

https://keptn.sh

ONE PLATFORM
TO ORCHESTRATE THEM ALL

Automated Data-Driven Orchestration of all your tools



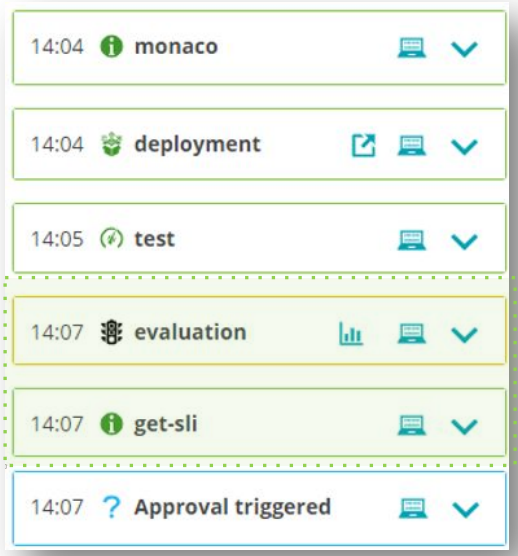


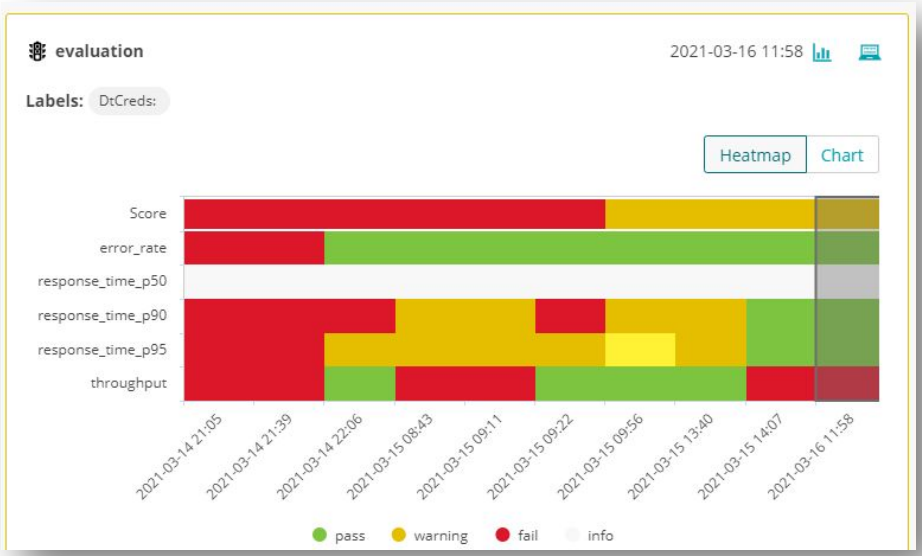
SLOs (queried from Observability) are in the core of Keptn

Orchestration sequences

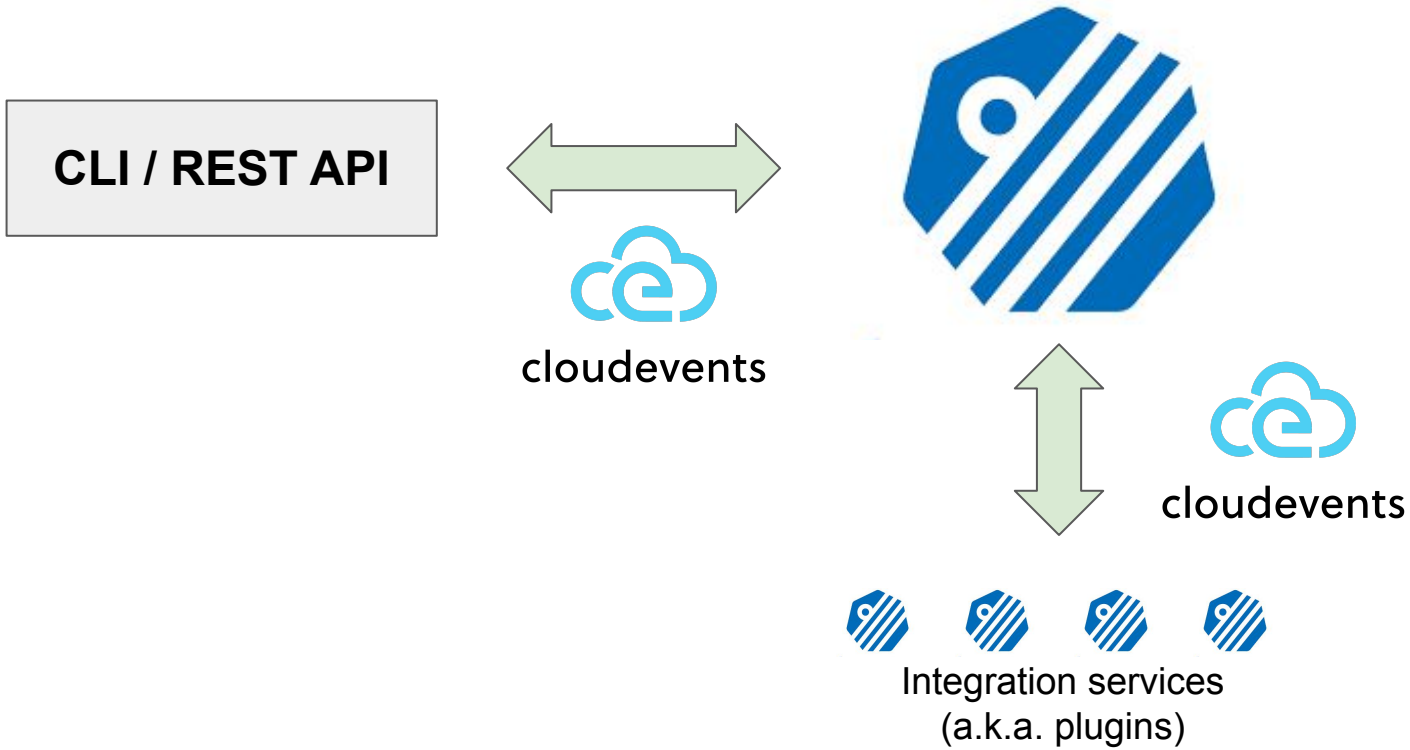
keptn

Orchestration, monitoring , deployment, test , evaluation of SLOs





Keptn integrates with other tools



Keptn Adopters

Keptn Use-Cases

Keptn use-case #0
IFTTT for operations

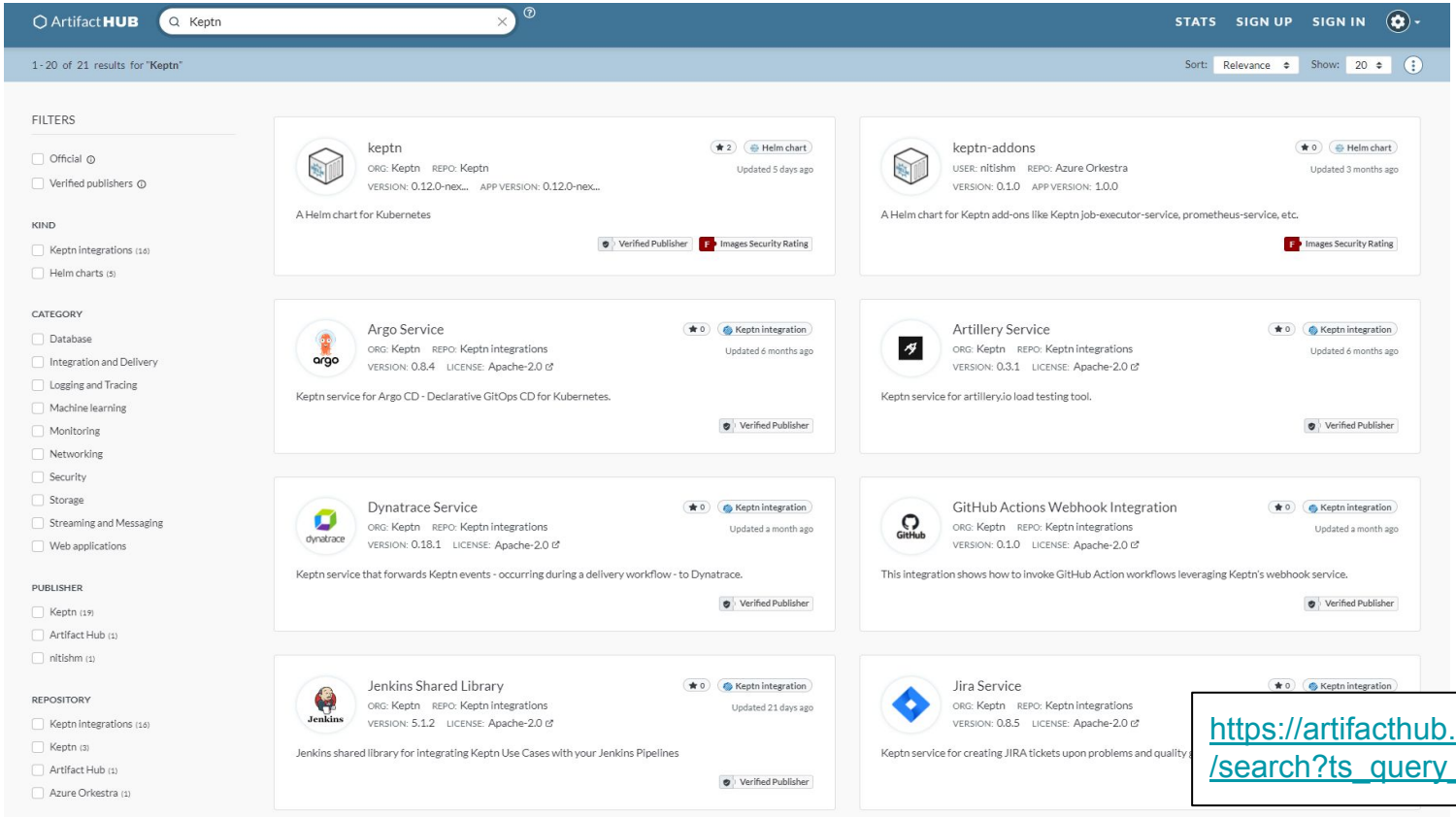
cloudevents
keptn
SLO Evaluation &
Monitoring
Auto-remediation
Notifications
HELM
4,000+ apps

- Shipyard.yaml
- Internal Pipeline Engine
- Manual triggering
- Triggering on events

40 lines (40 sloc) | 1.11 KB

```yaml
apiVersion: "spec.keptn.sh/0.2.0"
kind: "Shipyard"
metadata:
  name: "shipyard-sockshop"
spec:
  stages:
    - name: "hardening"
      sequences:
        - name: "delivery"
          tasks:
            - name: "deployment"
              properties:
                deploymentstrategy: "user_managed"
            - name: "test"
              properties:
                teststrategy: "performance"
            - name: "evaluation"
    - name: "production"
      sequences:
        - name: "delivery"
          triggeredOn:
            - event: "hardening.delivery.finished"
          tasks:
            - name: "deployment"
              properties:
                deploymentstrategy: "user_managed"
            - name: "release"
        - name: "remediation"
          triggeredOn:
            - event: "production.remediation.finished"
              selector:
                match:
                  evaluation.result: "fail"
          tasks:
            - name: "get-action"
            - name: "action"
            - name: "evaluation"
              triggeredAfter: "2m"
              properties:
                timeframe: "2m"
```

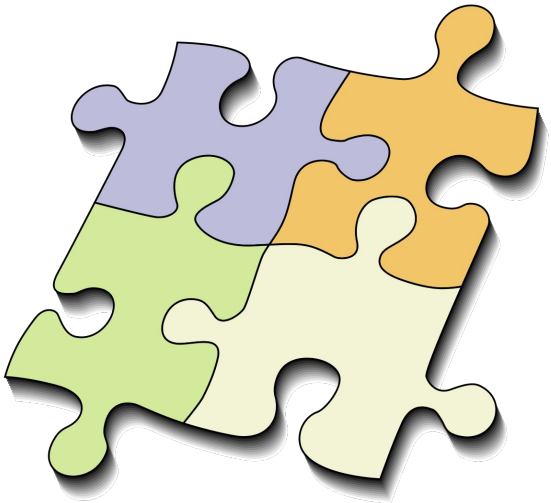
Keptn sequences are extensible



https://artifacthub.io/packages/search?ts_query_web=Keptn

Extensions

- Integration services (a.k.a plugins)
- Job Executor Service steps
- Webhook service steps



keptn-contrib/**job-executor-service**

11 Contributors

16 Issues

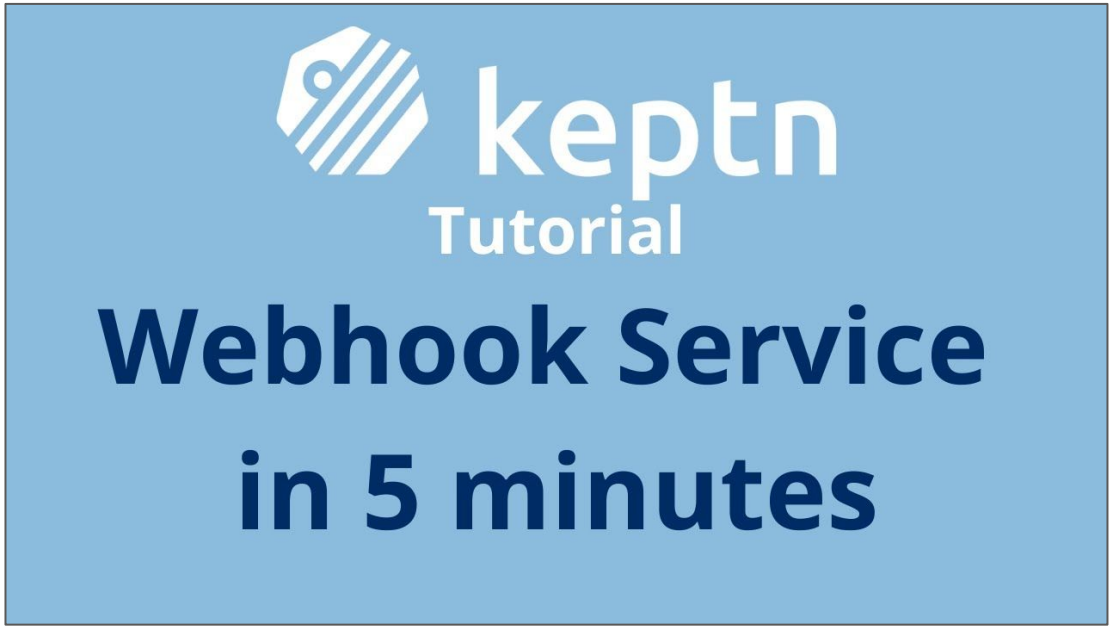
1 Discussion

6 Stars

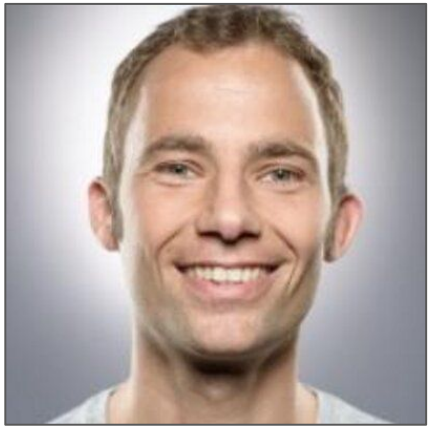
7 Forks

github.com/keptn-contrib/job-executor-service

Webhook Service



youtube.com/watch?v=0vJS7ecayGw



https://artifacthub.io/packages/search?ts_query_web=Keptn

Example: Zapier Webhook Integration

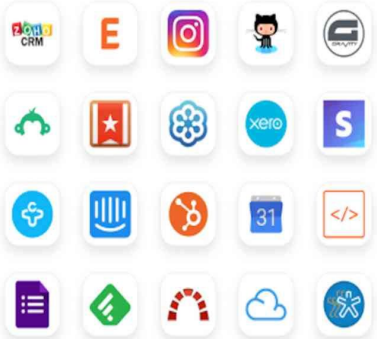
Metrics / SLI Providers

keptn

SLO Evaluation & Monitoring

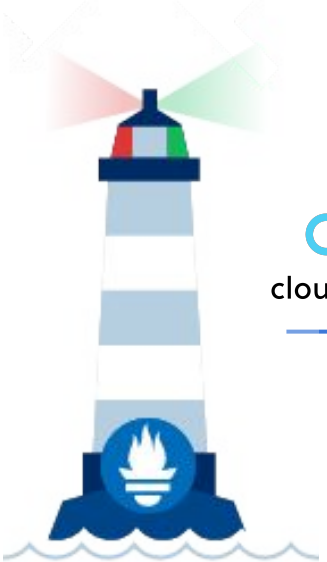
Notifications

zapier



https://artifacthub.io/packages/search?ts_query_web=Keptn

Keptn use-case #1
SLO Monitoring



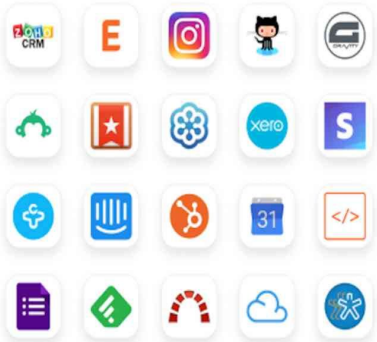
cloudevents

keptn

SLO Evaluation &
Monitoring

Auto-remediation

Notifications



Metrics / SLI Providers

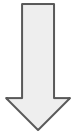
sli.yml

8 lines (8 sloc) | 748 Bytes

```
---
spec_version: '1.0'
indicators:
  http_response_time_seconds_main_page_sum: sum(rate(http_server_request_duration_seconds_sum{method="GET",route="/",status_code="200",jo
  failing_request: promhttp_metric_handler_requests_total{code!="200",job="$SERVICE-$PROJECT-$STAGE"}
  http_requests_total_sucess: http_requests_total{status="success",job="$SERVICE-$PROJECT-$STAGE"}
  go_routines: go_goroutines{job="$SERVICE-$PROJECT-$STAGE"}
  request_throughput: sum(rate(http_requests_total{status="success",job="$SERVICE-$PROJECT-$STAGE"}[$DURATION_SECONDS]))
```

https://github.com/keptn/examples/blob/master/quickstart/demo/prometheus/sli.yaml

sli.yml



slo.yml

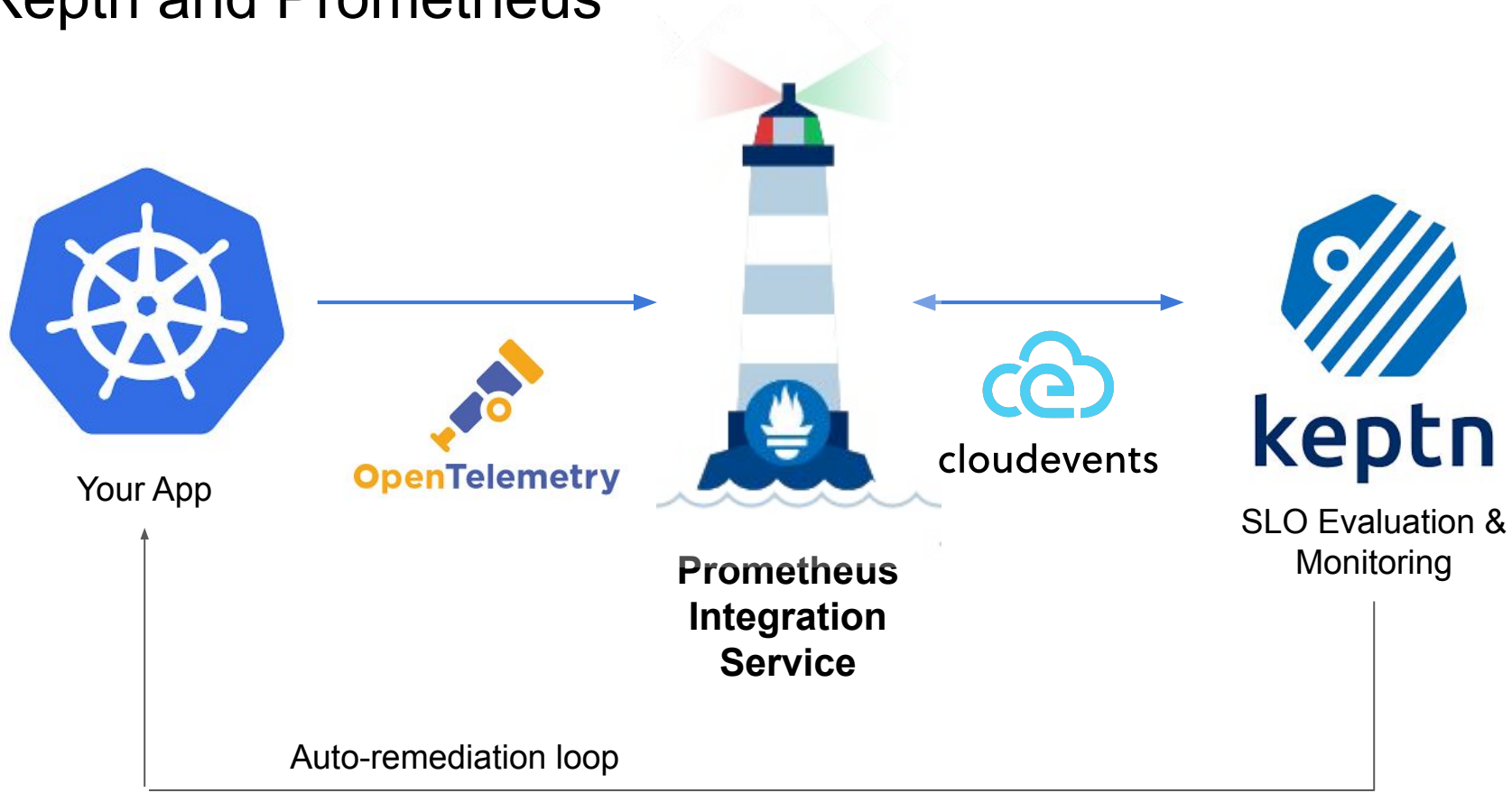
https://github.com/keptn/examples/blob/master/quickstart/demo/slo.yaml

35 lines (35 sloc) | 737 Bytes

```
---
spec_version: '0.1.0'
comparison:
  compare_with: "single_result"
  include_result_with_score: "pass"
  aggregate_function: avg
objectives:
  - sli: http_response_time_seconds_main_page_sum
    displayName: "HTTP Response Time"
    pass:
      - criteria:
          - "<=0.4"
    warning:
      - criteria:
          - "<=0.1"
  - sli: request_throughput
    displayName: "Request Throughput"
    pass:
      - criteria:
          #- "<=+100%"
          - ">=-80%"
  - sli: go_routines
    displayName: "Go Routines"
    key_sli: true
    pass:
      - criteria:
          - "<=30"
  - sli: failing_request
    displayName: "Failing Requests"
    pass:
      - criteria:
          - "<10"
total_score:
  pass: "90%"
  warning: "75%"
```

Keptn use-case #2
Auto-remediation

Keptn and Prometheus



Auto-remediation in Keptn

- Triggered on failing SLO evaluation
- Remediation.yml

17 lines (17 sloc) | 425 Bytes

```yaml
apiVersion: spec.keptn.sh/0.1.4
kind: Remediation
metadata:
  name: carts-remediation
spec:
  remediations:
    - problemType: out_of_memory
      actionsOnOpen:
        - action: restart
          name: restart
          description: Restart Pod
    - problemType: response_time_p90
      actionsOnOpen:
        - action: scaling
          name: scaling
          description: Scale up
          value: "1"
```

Auto-remediation in Keptn

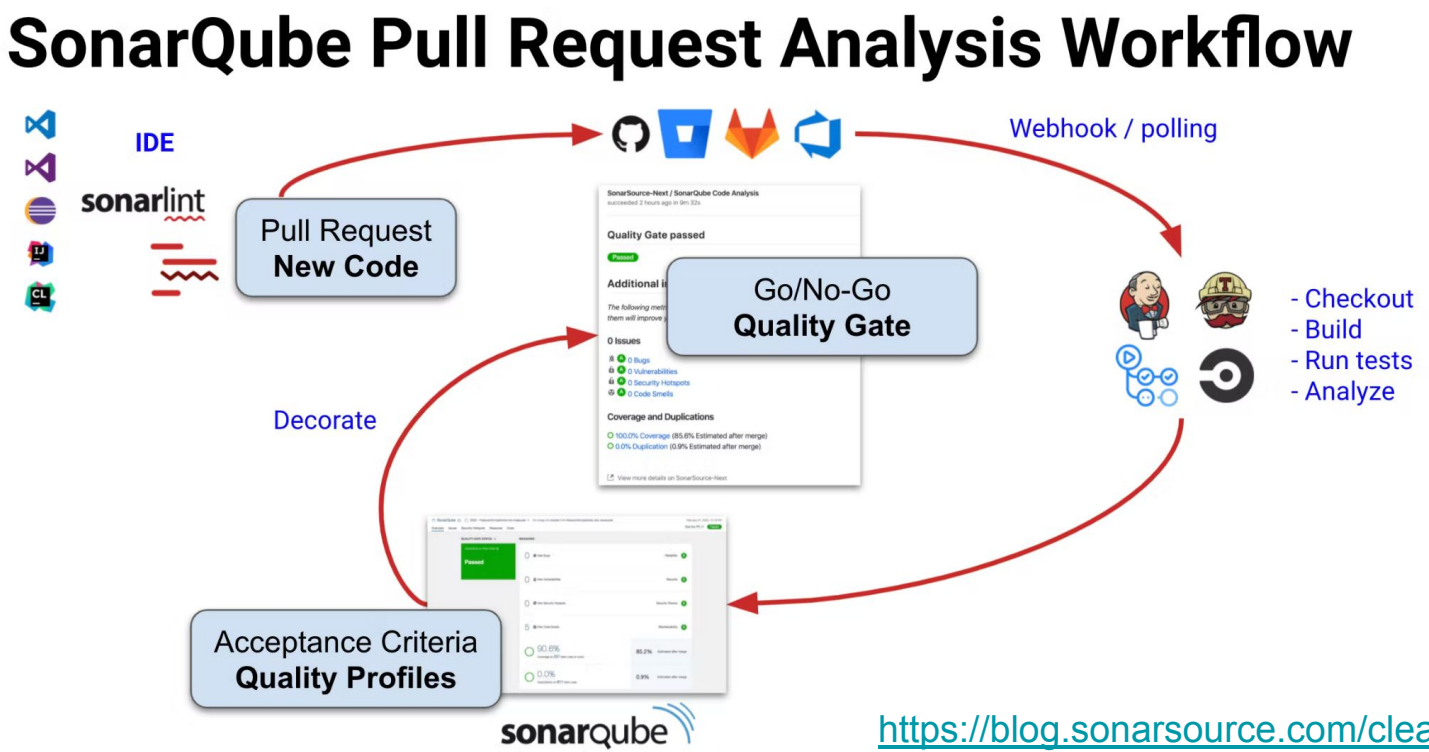
- Triggered on failing SLO evaluation
- Remediation.yml
- Auto-remediation definition in shipyard.yml
- Triggered by events

```
28          - name: "remediation"
29            triggeredOn:
30              - event: "production.remediation.finished"
31                selector:
32                  match:
33                    evaluation.result: "fail"
34            tasks:
35              - name: "get-action"
36              - name: "action"
37              - name: "evaluation"
38                triggeredAfter: "2m"
39                properties:
40                  timeframe: "2m"
```

Keptn use-case #3

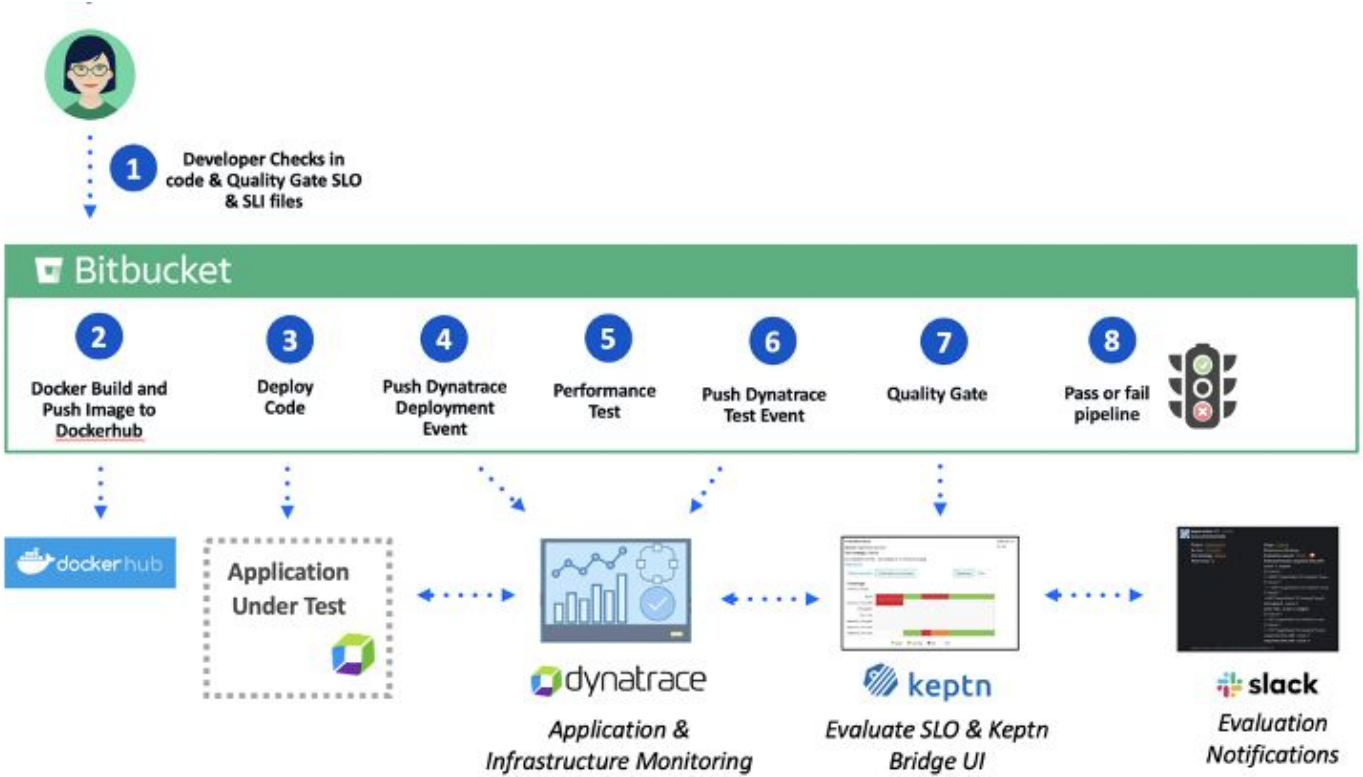
Embedding Keptn in your pipelines

Quality Gates. Example

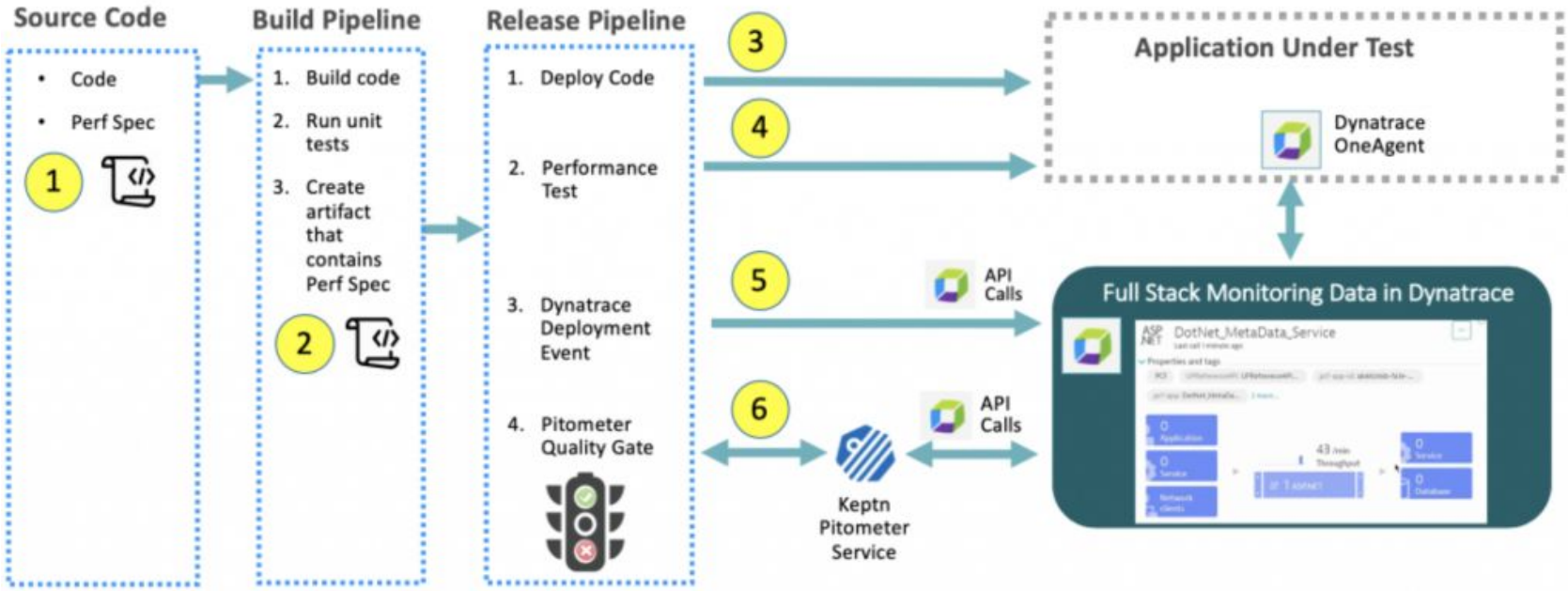


https://blog.sonarsource.com/clean_coding-quality_profile_quality_gate_guidance

Example. Quality Assurance



Quality gates with Keptn: Real life example

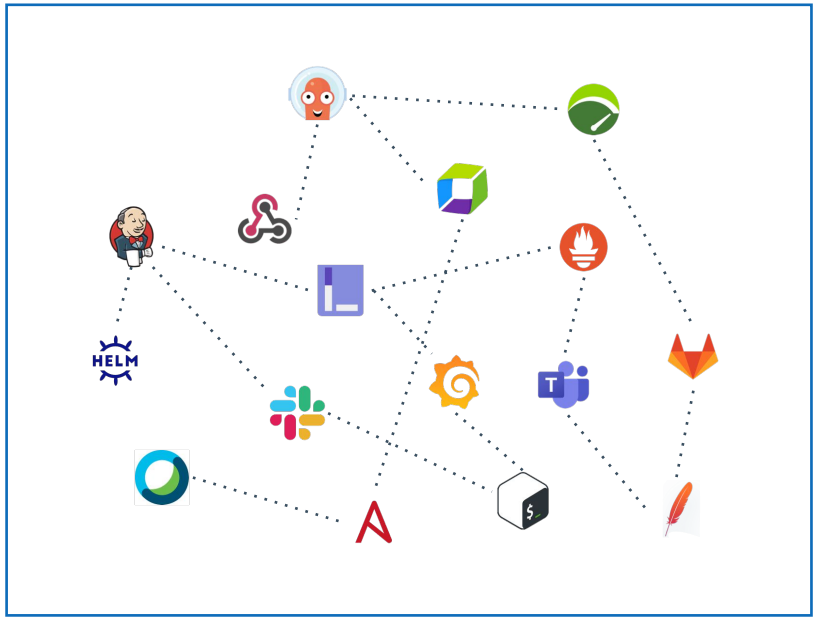


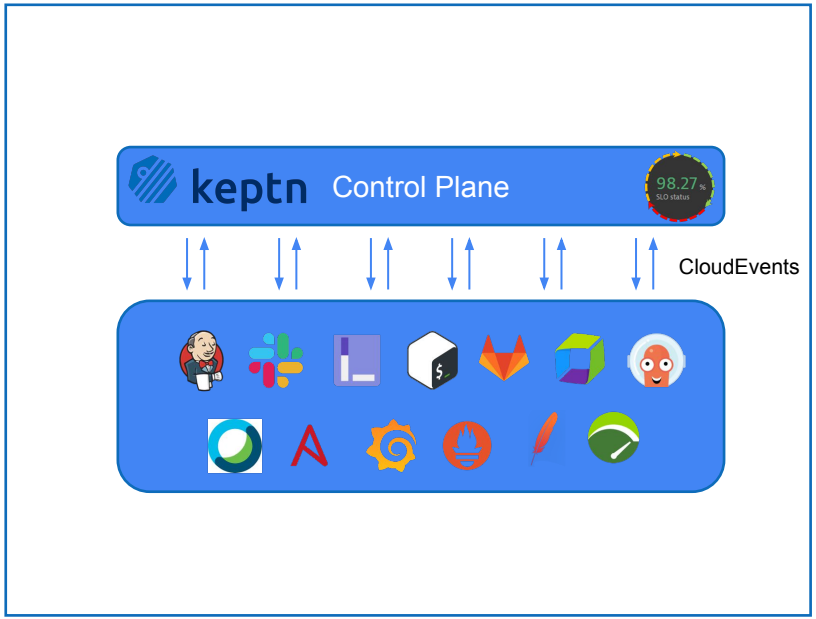
https://cloudblogs.microsoft.com/opensource/2019/06/11/five-steps-add-automated-performance-quality-gates-azure-devops-pipelines/

Keptn use-case #4
Drive your pipelines

ONE PLATFORM
TO ORCHESTRATE THEM ALL

Data-Driven Orchestration of your tools



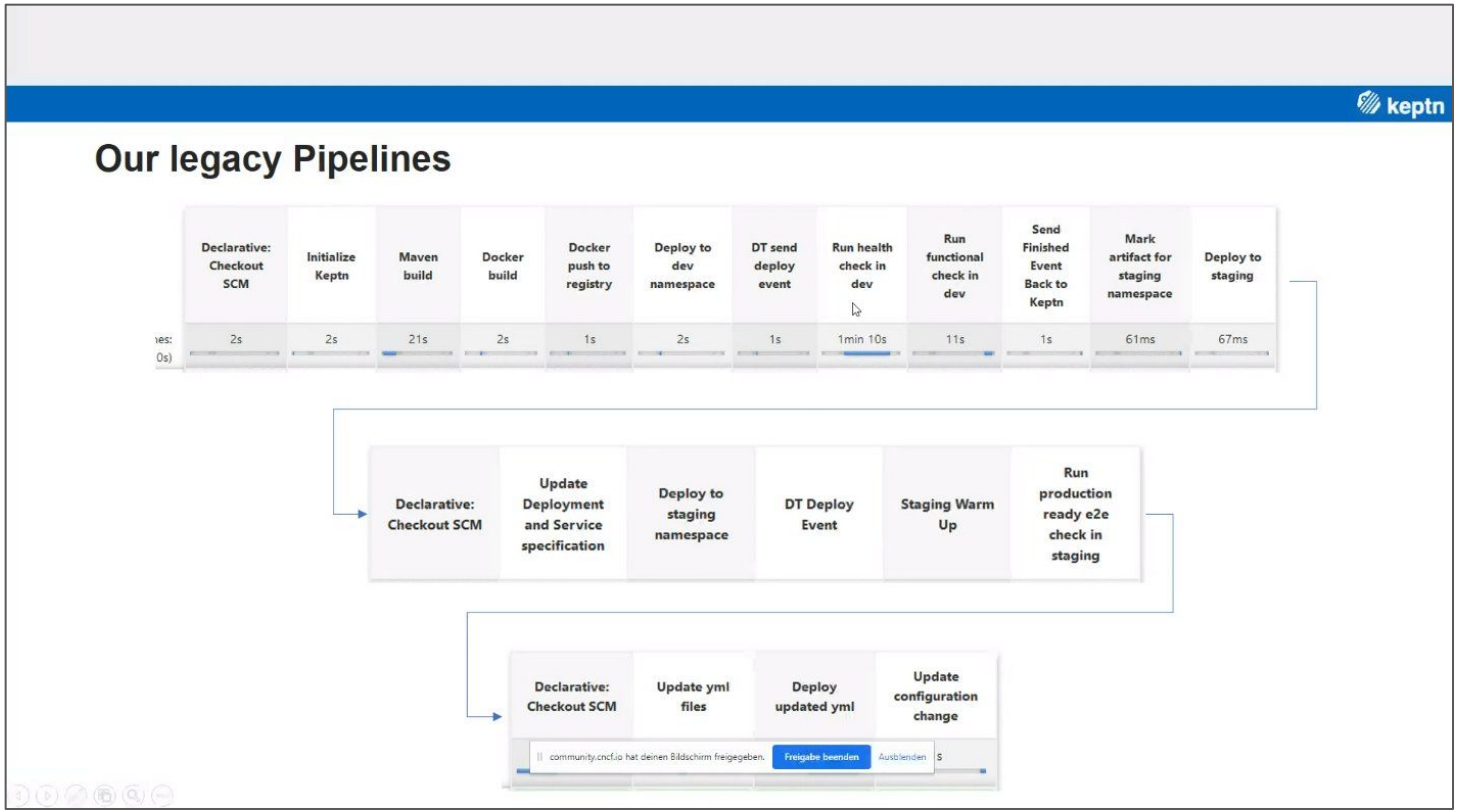


Story time!

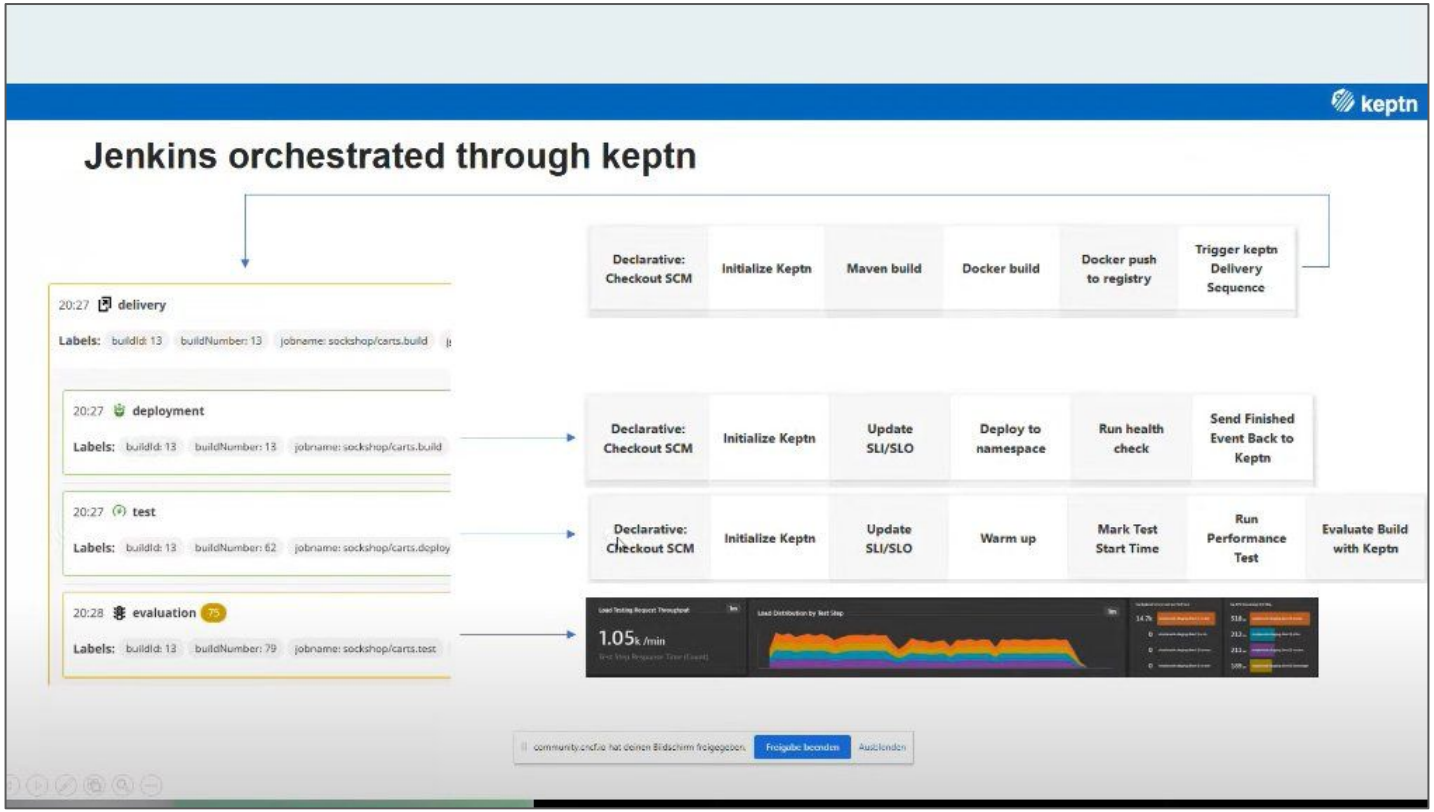
youtube.com/watch?v=9yCahPW7s8U

community.cncf.io/events/details/cncf-keptn-community-presents-keptn-office-hours-at-kubecon-cloud-native-con/

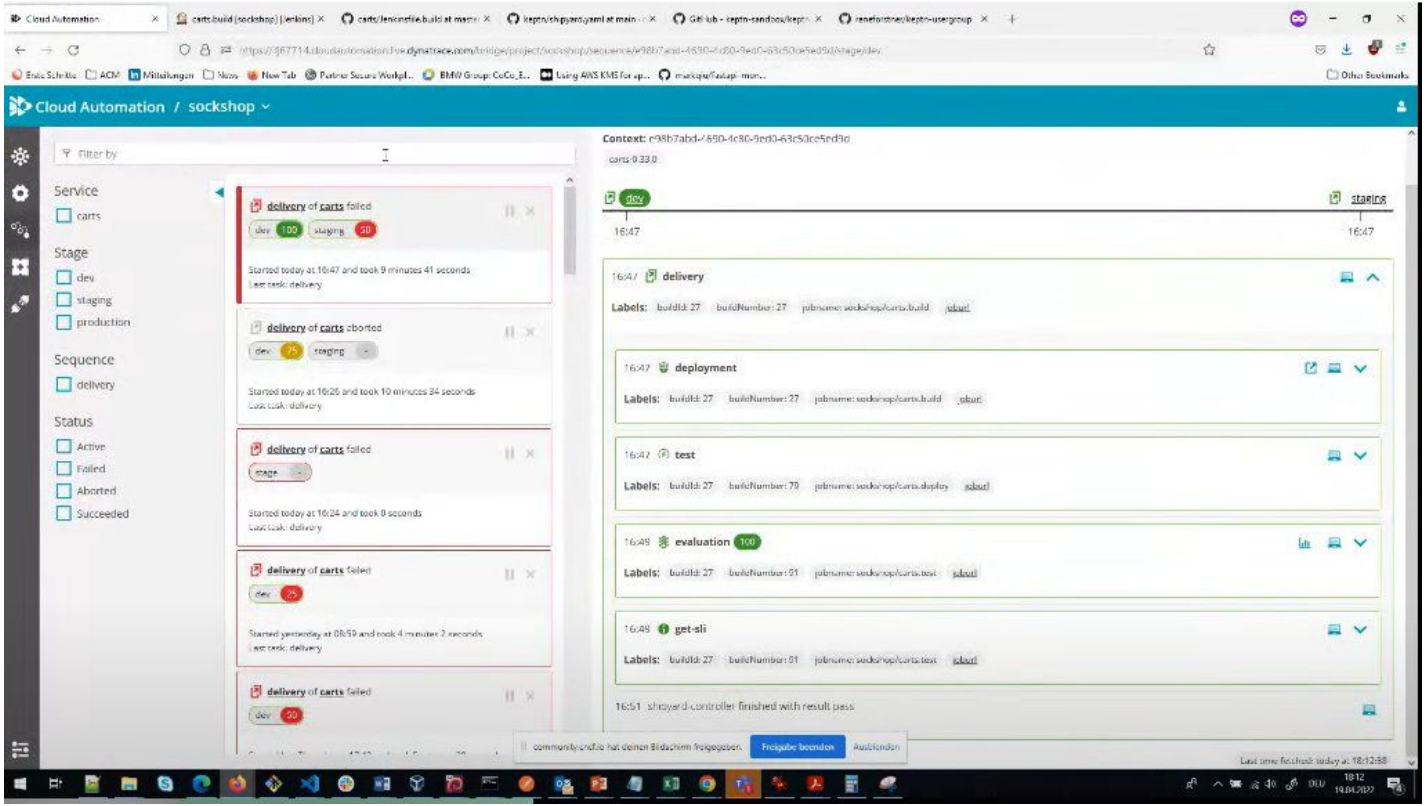
Story by NTT Data



Story by NTT Data



Story by NTT Data



Thank you,
Keptn Obvious!

keptn.sh

Takeaways

- Keptn - Data-driven delivery and operations for **YOUR** cloud native apps
- Keptn is not a CI/CD tool
- Keptn is not just for quality gates
- Evaluating quality gates is important in software development
- Keptn can help with automating quality gates!

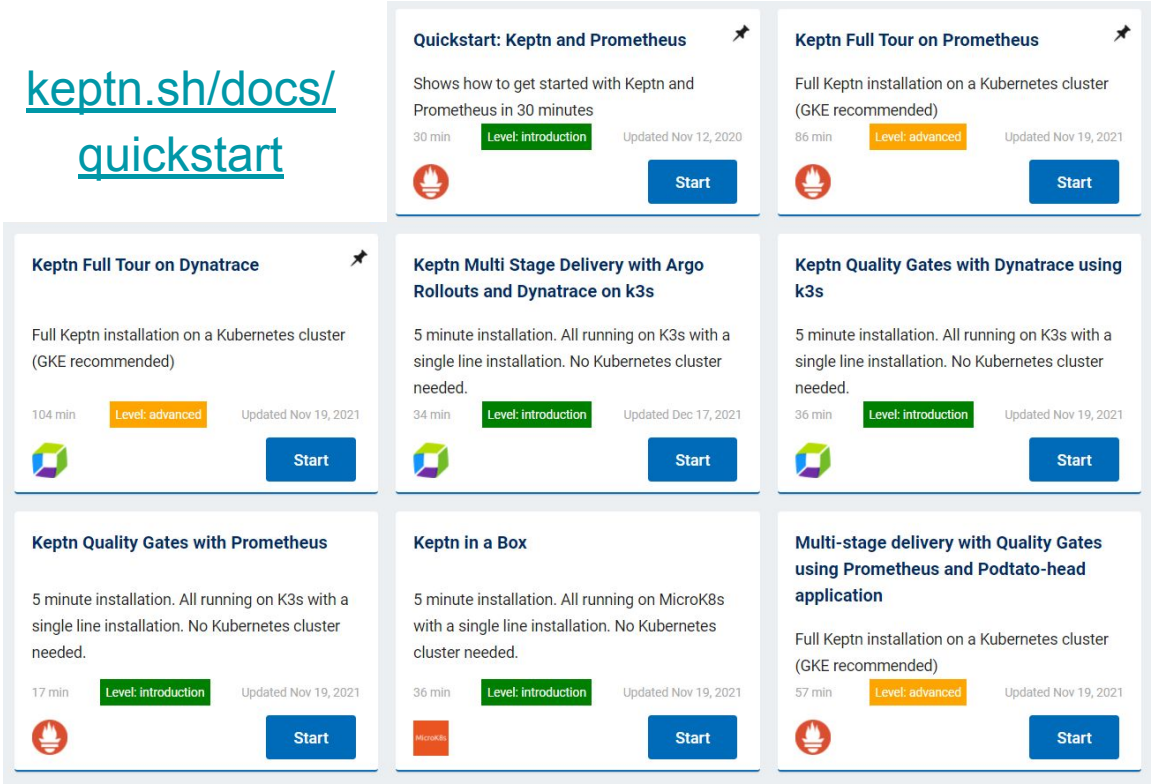
Come aboard!

Quickstart (K3D, K8s)

Tutorials:

- Prometheus
- Dynatrace
- ArgoCD
- Jenkins
- Soon: Datadog

keptn.sh/docs/quickstart



More about Keptn

Techworld with Nana,

March 2022

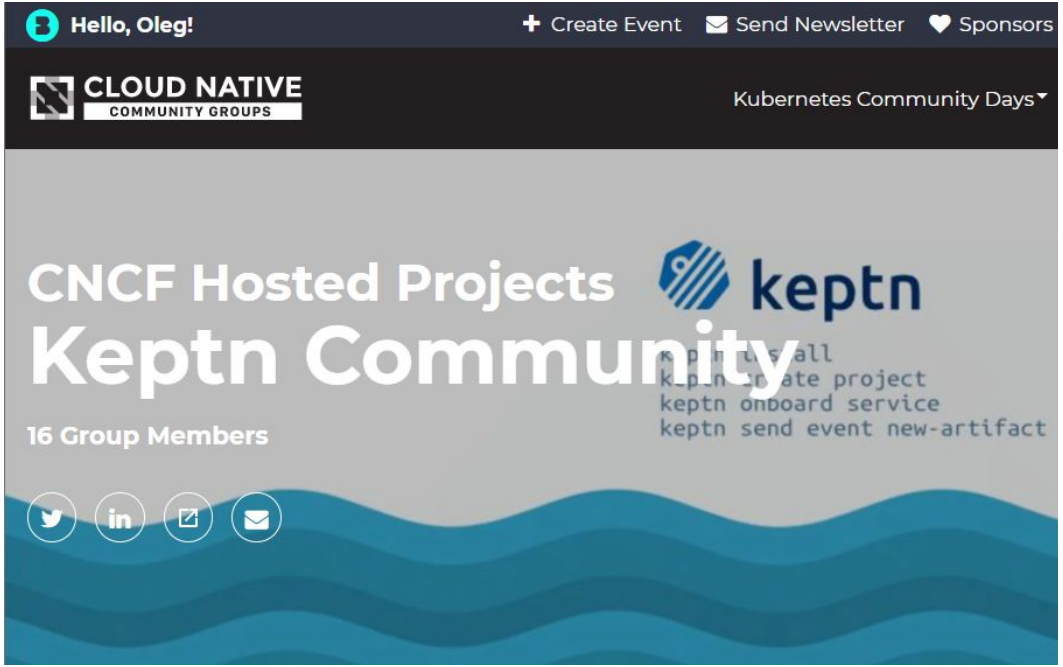
https://www.youtube.com/watch?v=3EEZmSwMXp8

Participating in Keptn

- We are looking for users and contributors!
- keptn.sh/community/contributing
  - K8s, Golang, Javascript, Documentation, etc.
  - SRE and Operations
- We participate in Google Summer of Code
- Slack: keptn.sh/community/#slack

Join us online

- Zoom => CNCF Community Portal
- community.cncf.io/keptn-community
- Powered by Bevy
- Videos go to YouTube



Keptn

100% OFF*

* unlimited offer

Get it at keptn.sh!!!

QUESTIONS?

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GitHub: oleg-nenashev

Twitter: @oleg_nenashev