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Don‘t deploy into the DARK!

DORA Metrics: automatically, for all your k8s workloads!

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OpenTelemetry

OpenFeature

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CLOUD NATIVE COMPUTING FOUNDATION
INCUBATING PROJECT

CLOUD NATIVE COMPUTING FOUNDATION
We are a Cloud Native Computing Foundation Sandbox project.

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KeptnV1: General Purpose Orchestration for Cloud and Non-Cloud-Native Tooling on K8s

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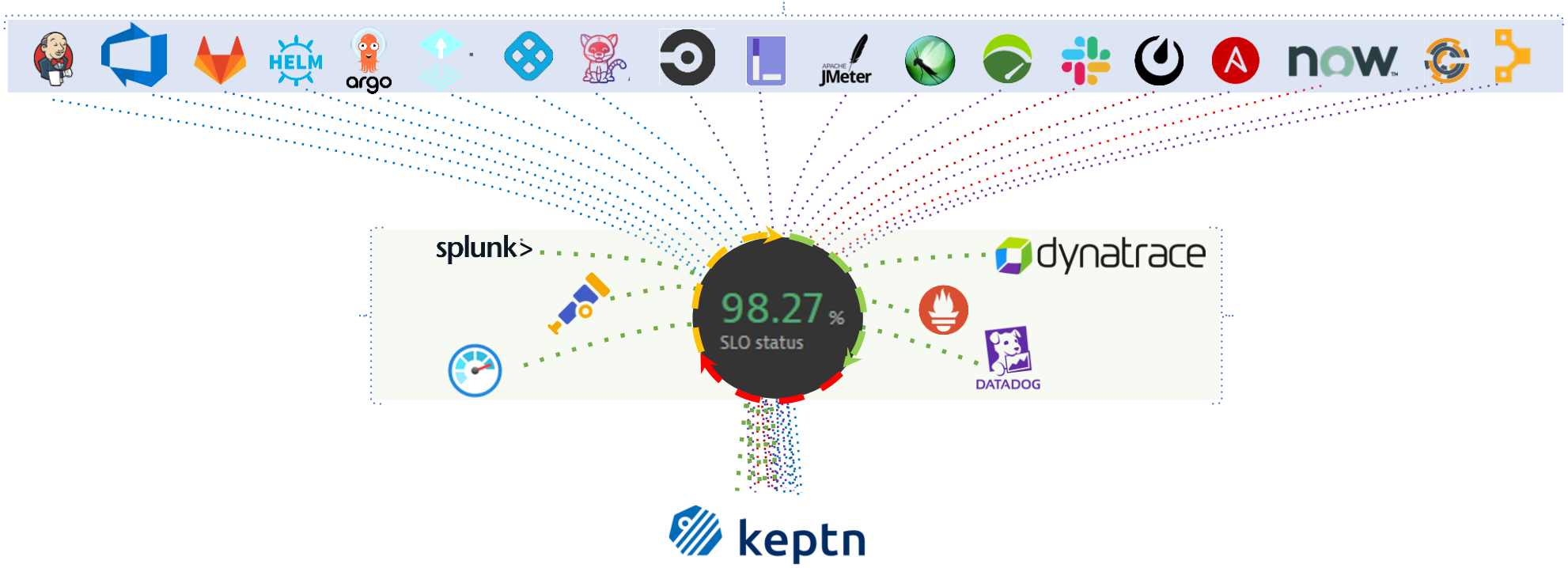
***Keptn** can **connect** to **any** of your **tools through** an **open event standard** to **automate delivery** and **remediation** sequences*



Since 2022 we are proud to be a

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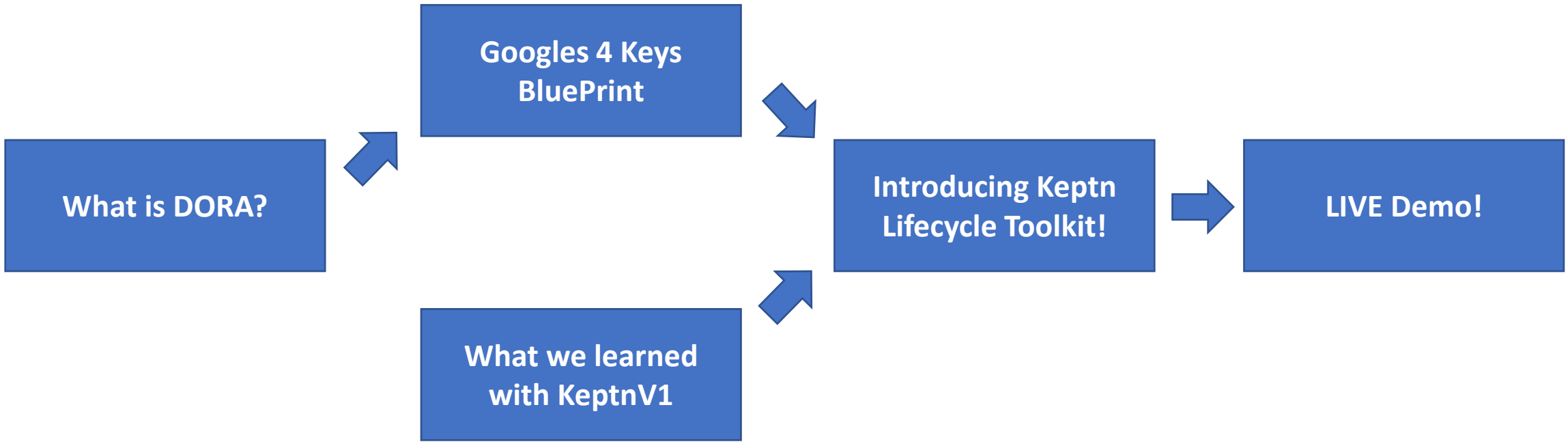
What does this have to do with **DORA**?

&

What is **DORA anyway**?

What we are going to learn today!



What is DORA?

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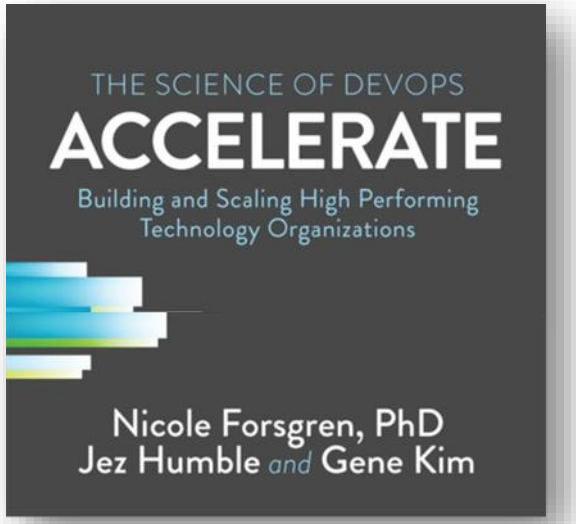
?

DORA: Measuring DevOps Efficiency

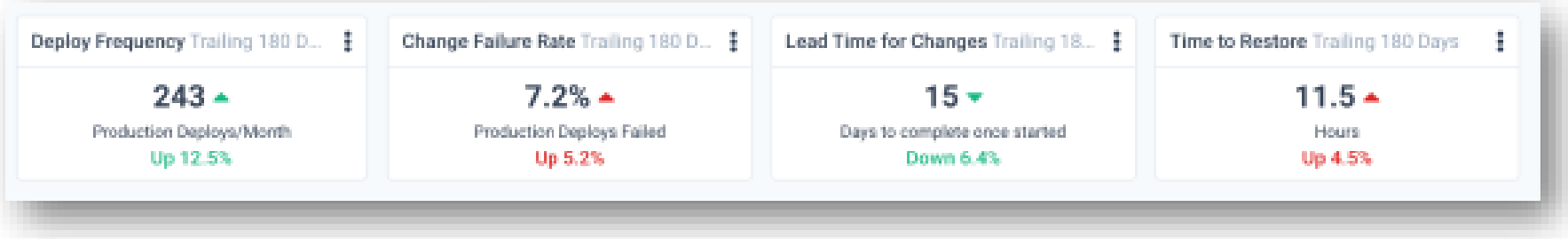


Deployment Frequency
How often an organization successfully releases to production

Lead Time for Changes
The amount of time it takes a commit to get into production

Change Failure Rate
The percentage of deployments causing a failure in production

Time to Restore Service
How long it takes an organization to recover from a failure in production



Read More: https://www.allstacks.com/blog/dora-metrics

Google's 4 Keys BluePrint: 4 Challenges to address when providing a K8s native implementation

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#1: Data Retrieval

PUSH: needs pipeline updates
Or PULL: needs access to API
Hard to achieve 100% coverage!

#2: App-Context

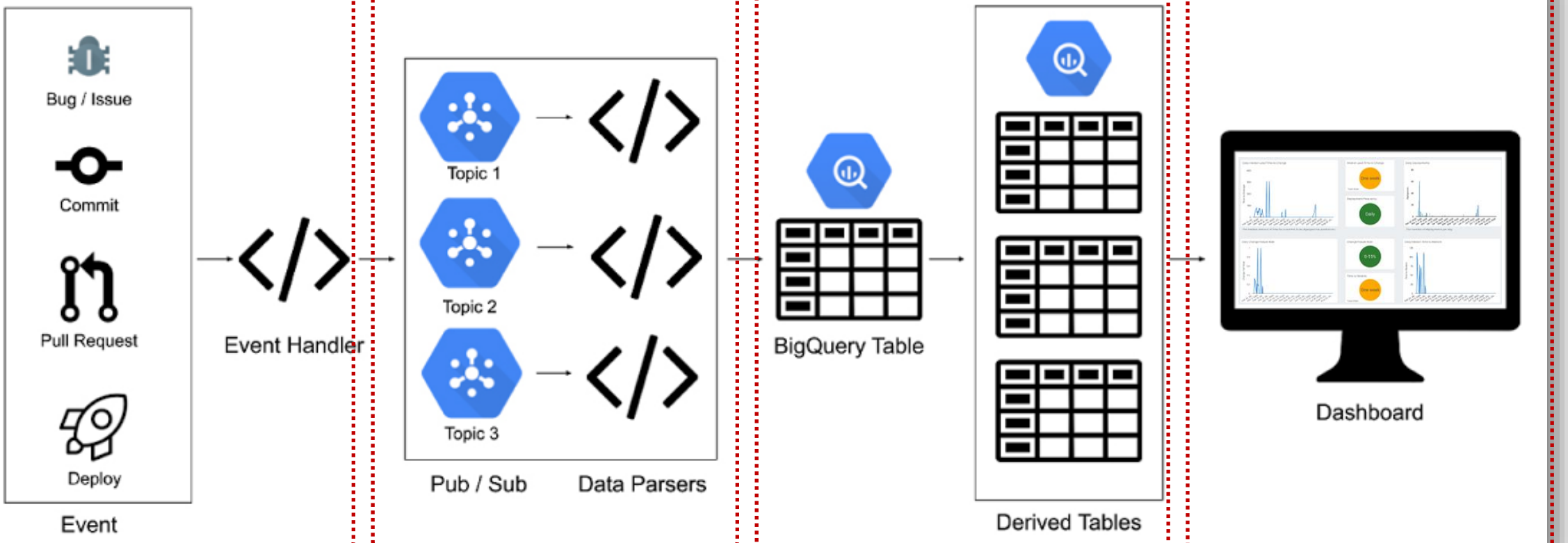
Manual mapping of pipeline, ticket, PR … data to "an app"

#3: Storage

Requires a Custom data store

#4: Analytics

Custom dashboarding.
Not using any open standards!

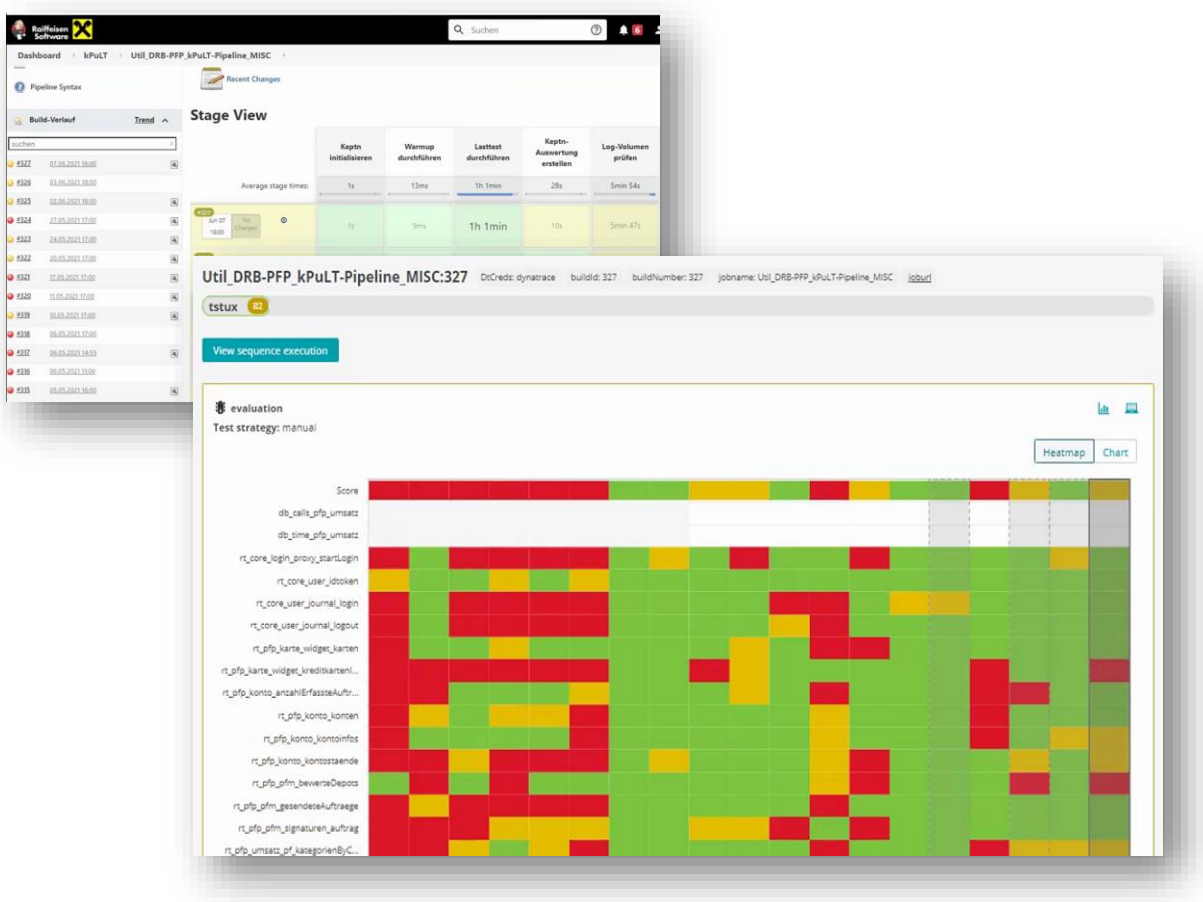


https://cloud.google.com/blog/products/devops-sre/using-the-four-keys-to-measure-your-devops-performance

What we have learned from our work with KeptnV1

Pod-Ready != Application Ready

That's why 90% Keptn Users adopted our SLO-based Validation



Zero Integration

It's ***hard integrating new tools into EVERY pipeline***. Especially in organizations with > 800 Global Dev Teams. Need a zero-integration approach

Configuration as CRDs

Many teams are adopting ArgoCD, Flux … non CRDs in external repository doesn't work in a "***GitOps world***"

OpenObservability

The CNCF community has agreed on ***OpenTelemetry and Prometheus*** for observability data. Why store it in MongoDB?

Application Awareness

While we deploy individual workloads (=microservices) we ***need visibility into applications*** that are made up of one or many services

Solution: A K8s **Operator*** to **Observe** and **Orchestrate App-aware Workload Lifecycle**

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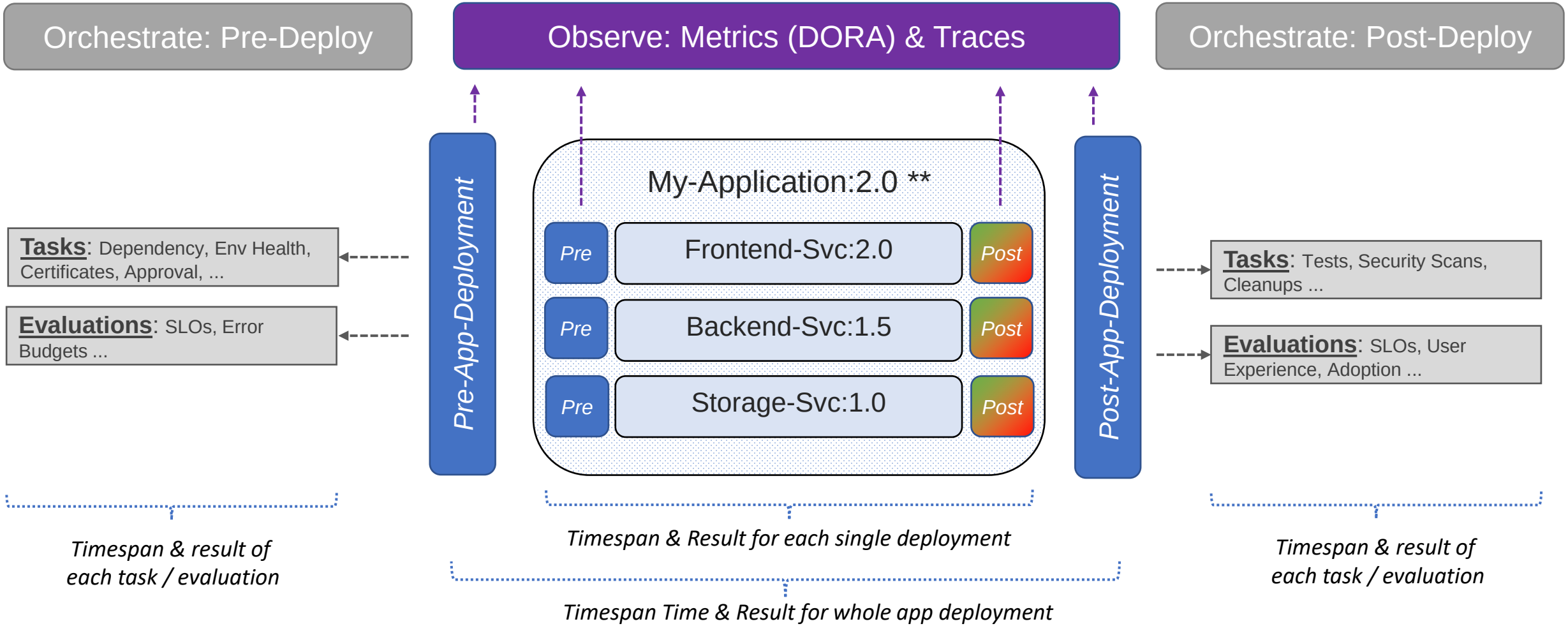

** K8s Operators can leverage K8s webhooks and extend K8s scheduler for pre- and post-deployment hooks*

*** K8s doesn't yet have a standard application concept but Delivery SIG is working on it*

Introducing Keptn Lifecycle Toolkit:
App-aware Workload Lifecycle Orchestration and Observability

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Example from upcoming Live Demo: Single deployment with Keptn annotations, Keptn Tasks and optional Keptn App

Step 1: Annotate your Deployment & StatefulSets!

```
kind: Deployment
name: simplenode
...
template:
  metadata:
    annotations:
      keptn.sh/workload: simplenode
      keptn.sh/version: 3.0.1
      keptn.sh/pre-tasks: notify
      keptn.sh/pre-eval: check-error-budget
      keptn.sh/post-tasks: api-tests, notify
      keptn.sh/post-eval: evaluate-slo
...
```

Step 2: Define Keptn Tasks and Evaluations!

```
kind: KeptnTaskDefinition
name: notify
...
spec:
  function: |
    let text = Deno.env.get("SECURE_DATA");
    let context = Deno.env.get("CONTEXT");
    let resp = await fetch("https://hooks.slack.com/xxxx");
    console.log("Sending slack message")
```

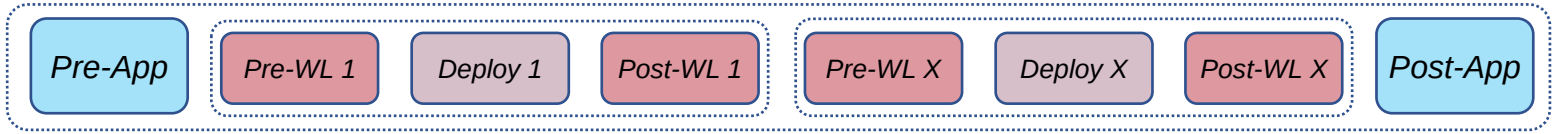
```
kind: KeptnEvaluation
name: evaluate-slo
Spec:
  source: prometheus
  objectives:
  - name: cpu capacity
    query: "sum(kube_node_status_capacity{resource='cpu'} "
    evaluationTarget: ">4"
```

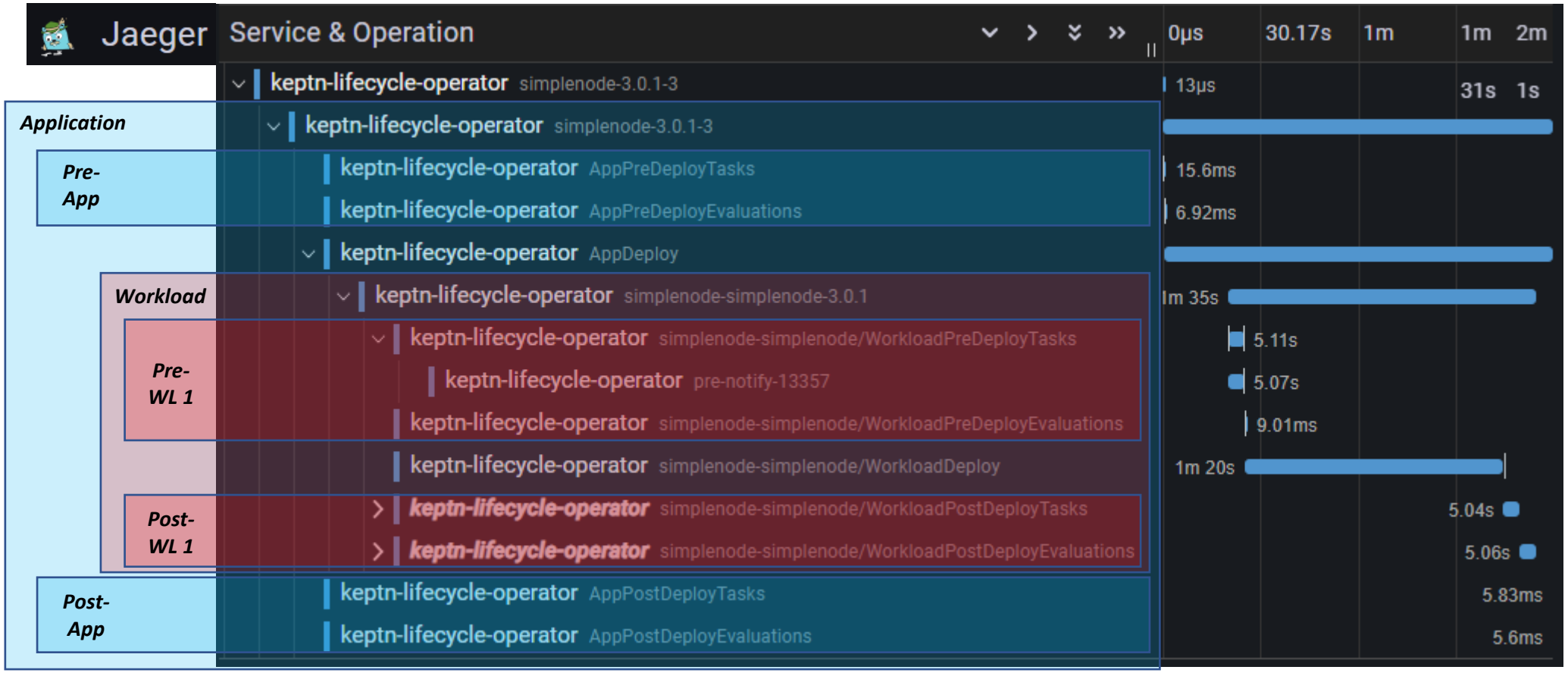
Step 3: (optional) KeptnApp for app-awareness !

```
kind: KeptnApp
name: simplenode-app
spec:
  workloads:
    - name: simplenode
      version: 3.0.1
    - name: simplenode-svc
      version: 2.0.1
  pre-task: check-approval
  pre-eval: check-error-budget
  post-tasks: functests, notify
  post-eval: evaluate-slo
```

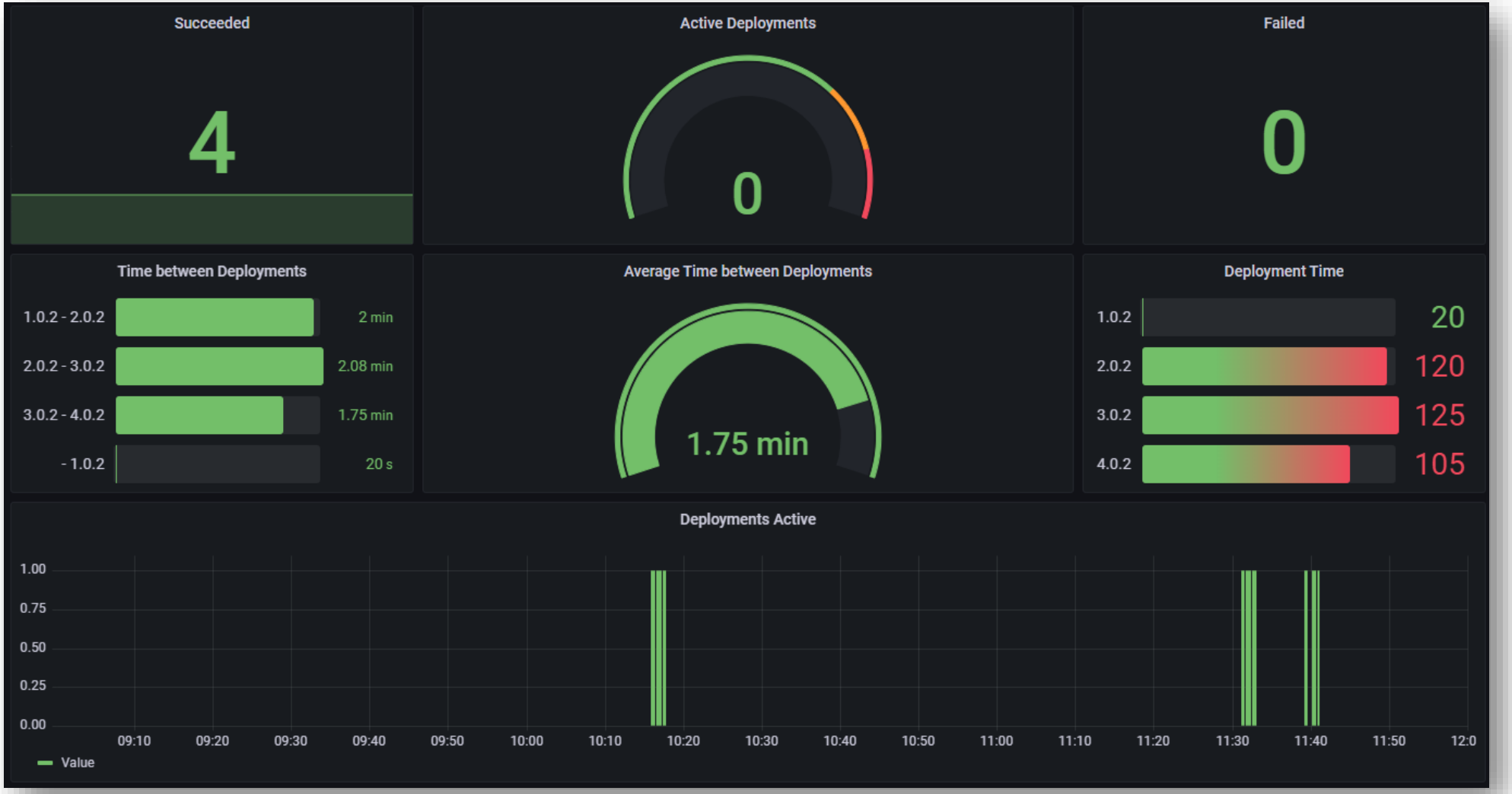
Keptn Lifecycle Toolkit: App-aware Workload Lifecycle OpenTelemetry Trace

```
$ kubectl apply *.yaml
```





Keptn Lifecycle Toolkit: App-aware Workload Lifecycle Prometheus Metrics



Keptn Lifecycle Toolkit: Keptn CRDs visualized in ArgoCD

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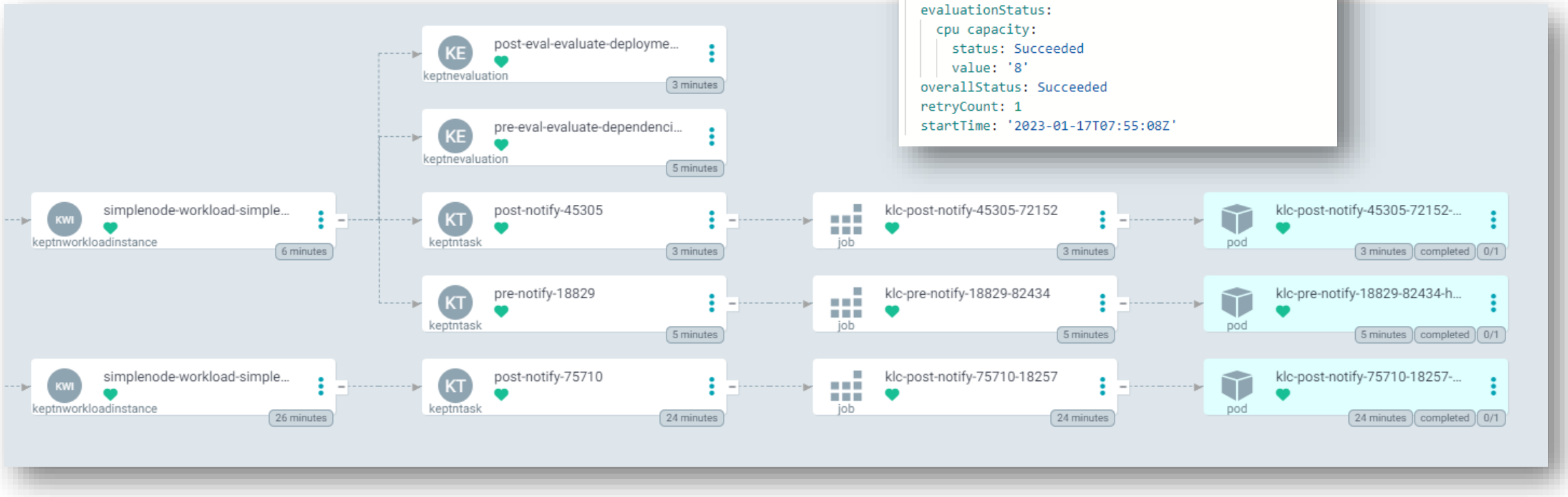
```yaml
spec:
  appName: simplenode-workload
  checkType: pre-eval
  evaluationDefinition: evaluate-dependencies
  retries: 10
  retryInterval: 5s
  workload: simplenode-workload-simplenode-workload
  workloadVersion: 1.0.2
status:
  endTime: '2023-01-17T07:55:09Z'
  evaluationStatus:
    cpu capacity:
      status: Succeeded
      value: '8'
  overallStatus: Succeeded
  retryCount: 1
  startTime: '2023-01-17T07:55:08Z'
```



Live Demo

Wrap-Up

DORA is just a side-benefit of what **K**eptn **L**ifecycle **T**oolkit can become!

Keptn Lifecycle Toolkit: Observing and Orchestrating Lifecycle of K8s Deployments

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Your Observability tool

Grafana · dynatrace · honeycomb.io · DATADOG

Extend your GitOps

Your Deployment:

```
image: mysvc:1.0
on-pre: dependency
```

Keptn-Task: (tooling for cluster)

```
name: dependency
function: exec.checkDBAvail()
name: notify
function: slack.send()
name: validate_slo
promql: errors<5% && rt<100ms
```

Keptn-App: (app-scope checks)

```
name: mybusinessapp
workloads: mysvc,yoursvc,xsvc
on-post: validate_slo,notify
on-post-success: promote
```

argo

```
$ kubectl apply -f install_keptn.yaml
Keptn Lifecycle Toolkit installed!
$ git add "keptn CRD files"
$ git commit
```

Visibility across all stages using observability standards

OpenTelemetry · Prometheus

deployment-traces · deployment-traces

sync

Dev

on-pre-deploy: dependency ✓

on-post-deploy: api_tests ✓, validate_slo 82

gitops · keptn

notify

promote

Staging

on-pre-deploy: dependency ✓

on-post-deploy: perf_tests ✓, security ✓, validate_slo 87

gitops · keptn

notify

promote

Prod

on-pre-deploy: dependency ✓, approval ✓

on-post-deploy: func_tests ✓, security ✓, validate_slo 100, cleanup ✓

gitops · keptn

notify

Day2Ops

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