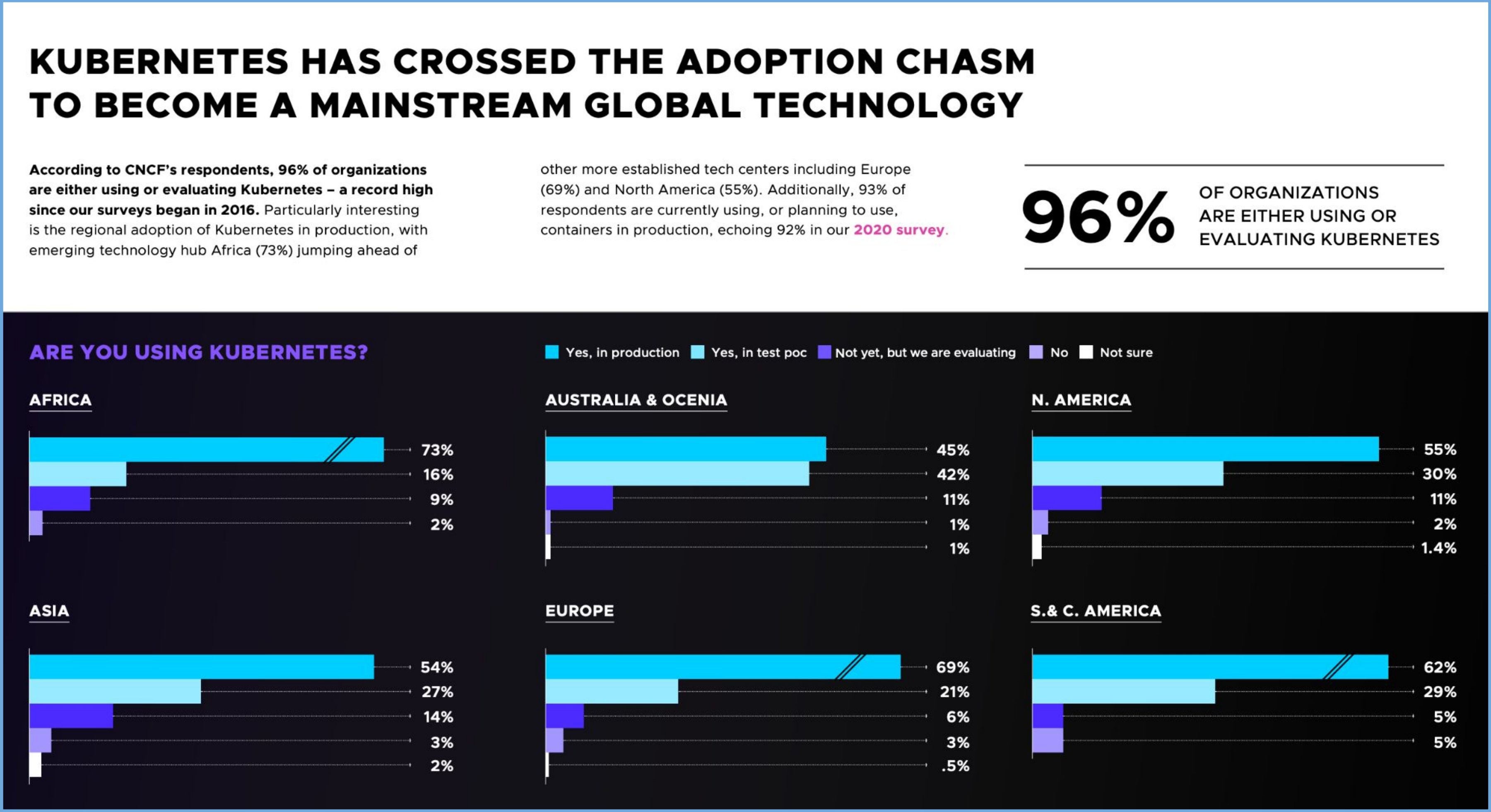
How to Generate Kubernetes Template Without Helm

KubeOps skills X <DEV> MOUNTAIN TECH FESTIVAL



KUBERNETES HAS CROSSED THE ADOPTION CHASM TO BECOME A MAINSTREAM GLOBAL TECHNOLOGY

According to CNCF's respondents, 96% of organizations are either using or evaluating Kubernetes – a record high since our surveys began in 2016. Particularly interesting is the regional adoption of Kubernetes in production, with emerging technology hub Africa (73%) jumping ahead of other more established tech centers including Europe (69%) and North America (55%). Additionally, 93% of respondents are currently using, or planning to use, containers in production, echoing 92% in our **2020 survey**.

96% OF ORGANIZATIONS ARE EITHER USING OR EVALUATING KUBERNETES

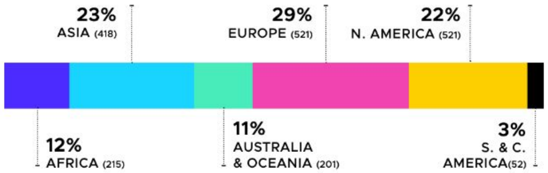
ARE YOU USING KUBERNETES?

KUBERNETES IS STARTING TO GO “UNDER THE HOOD” 1 / 3

CNCF saw this trend reflected in part one of our survey results: 79% of respondents use Certified Kubernetes Hosted platforms. Of those, the most popular are Amazon Elastic Container Service for Kubernetes (39%), Azure Kubernetes Service (23%), and Azure (AKS) Engine (17%).

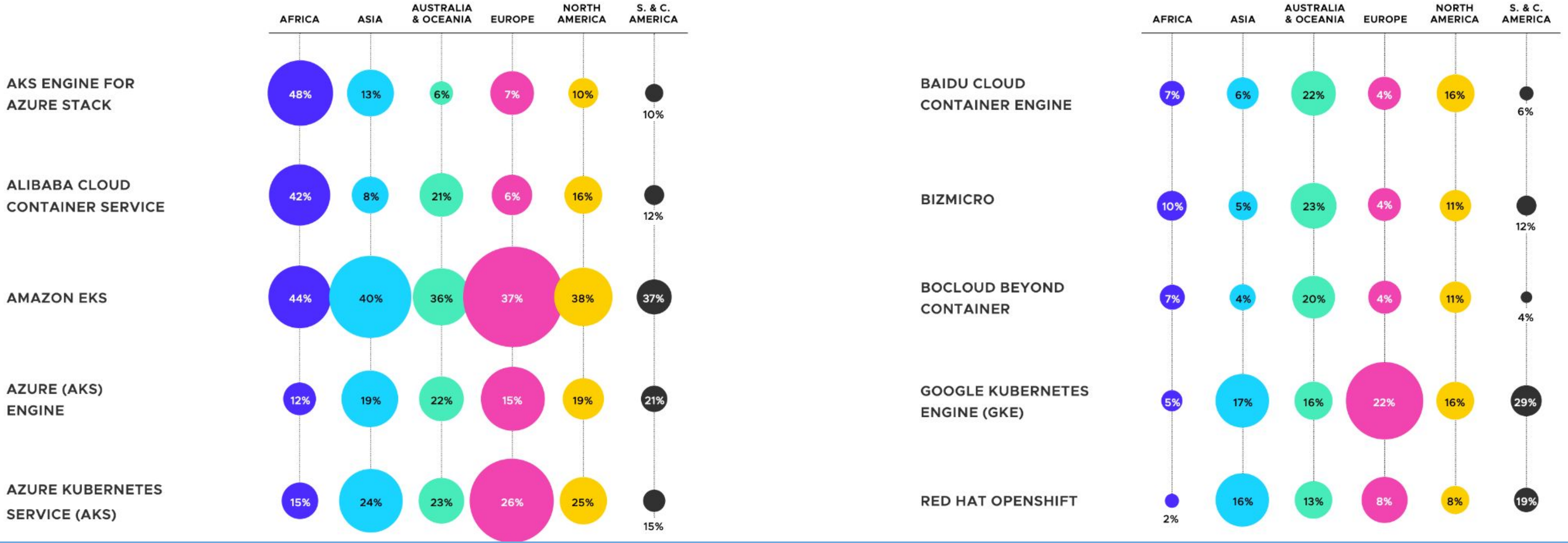
1809 RESPONDENTS

respondents could select more than one platform

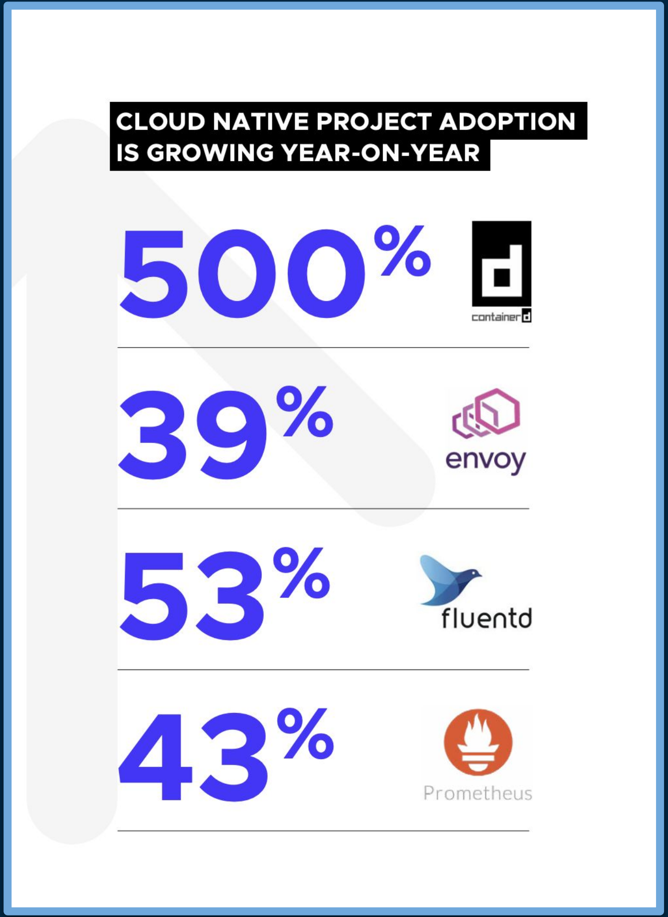


DOES YOUR ORGANIZATION USE ANY CERTIFIED KUBERNETES INSTALLERS?

Scale of circle denotes volume of respondents and platform combined



	AFRICA	ASIA	AUSTRALIA & OCEANIA	EUROPE	NORTH AMERICA	S. & C. AMERICA
AKS ENGINE FOR AZURE STACK	48%	13%	6%	7%	10%	10%
ALIBABA CLOUD CONTAINER SERVICE	42%	8%	21%	6%	16%	12%
AMAZON EKS	44%	40%	36%	37%	38%	37%
AZURE (AKS) ENGINE	12%	19%	22%	15%	19%	21%
AZURE KUBERNETES SERVICE (AKS)	15%	24%	23%	26%	25%	15%
BAIDU CLOUD CONTAINER ENGINE	7%	6%	22%	4%	16%	6%
BIZMICRO	10%	5%	23%	4%	11%	12%
BOCLOUD BEYOND CONTAINER	7%	4%	20%	4%	11%	4%
GOOGLE KUBERNETES ENGINE (GKE)	5%	17%	16%	22%	16%	29%
RED HAT OPENSHIFT	2%	16%	13%	8%	8%	19%



CLOUD NATIVE PROJECT ADOPTION IS GROWING YEAR-ON-YEAR

500%	containerd
39%	envoy
53%	fluentd
43%	Prometheus

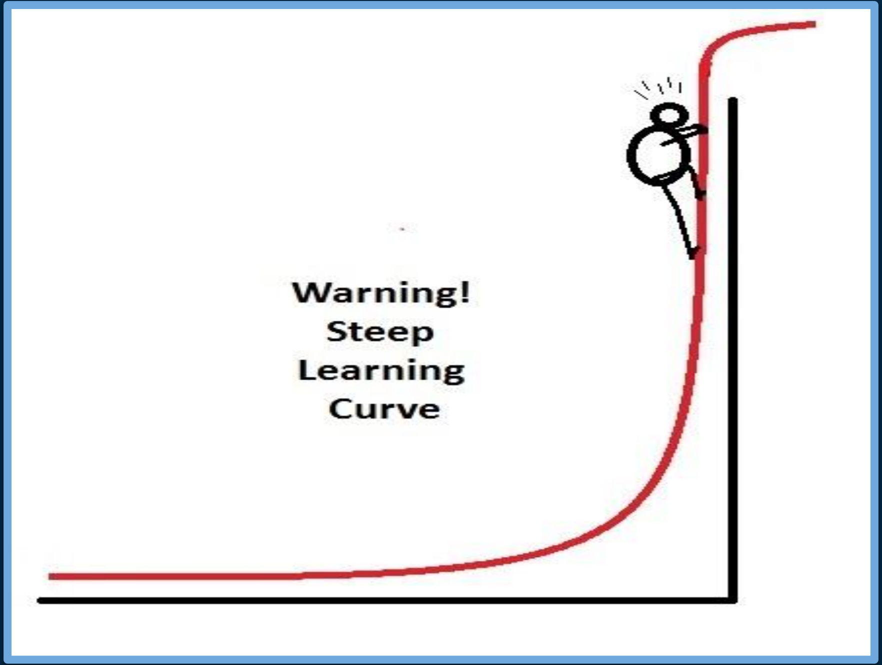
Container Runtime Engine

Network

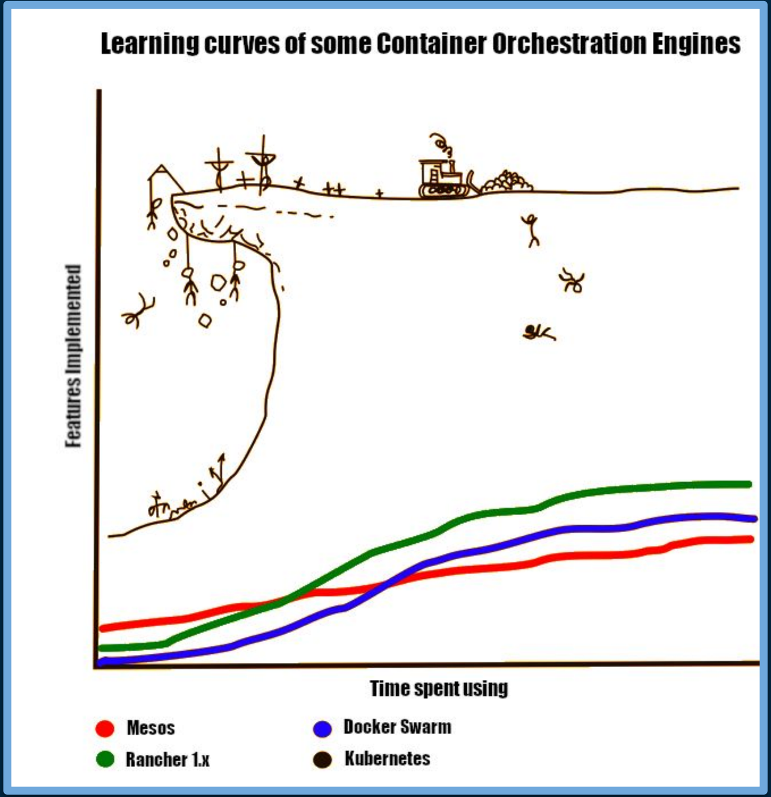
Data Collection

Monitoring System

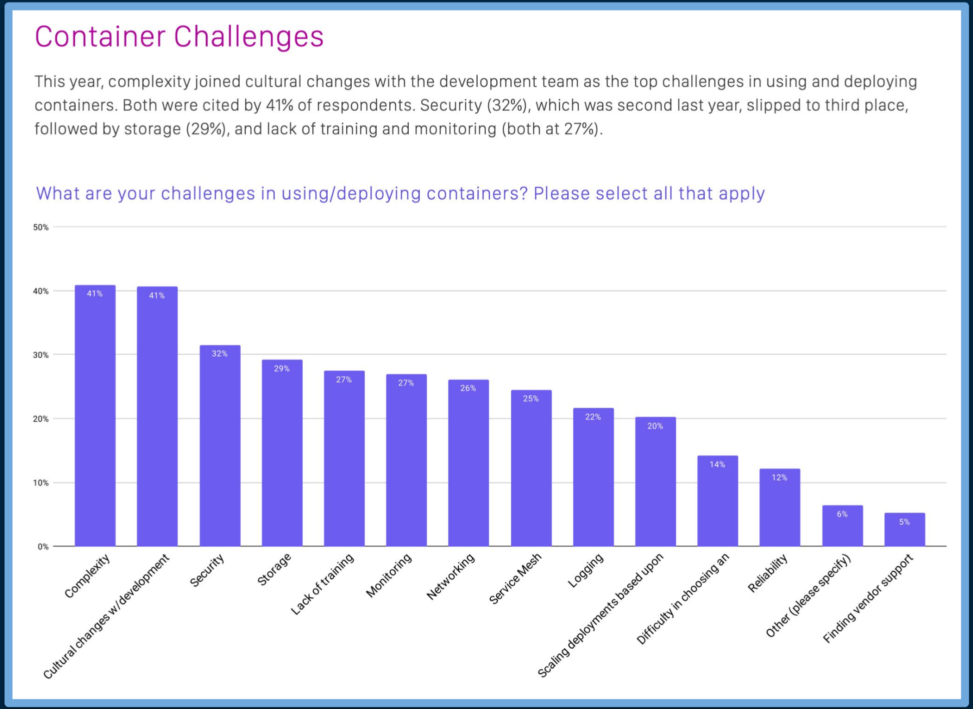
Kubernetes is not easy for developers



Kubernetes is not easy for developers (Cont.)



Kubernetes consists of many layers of complexity



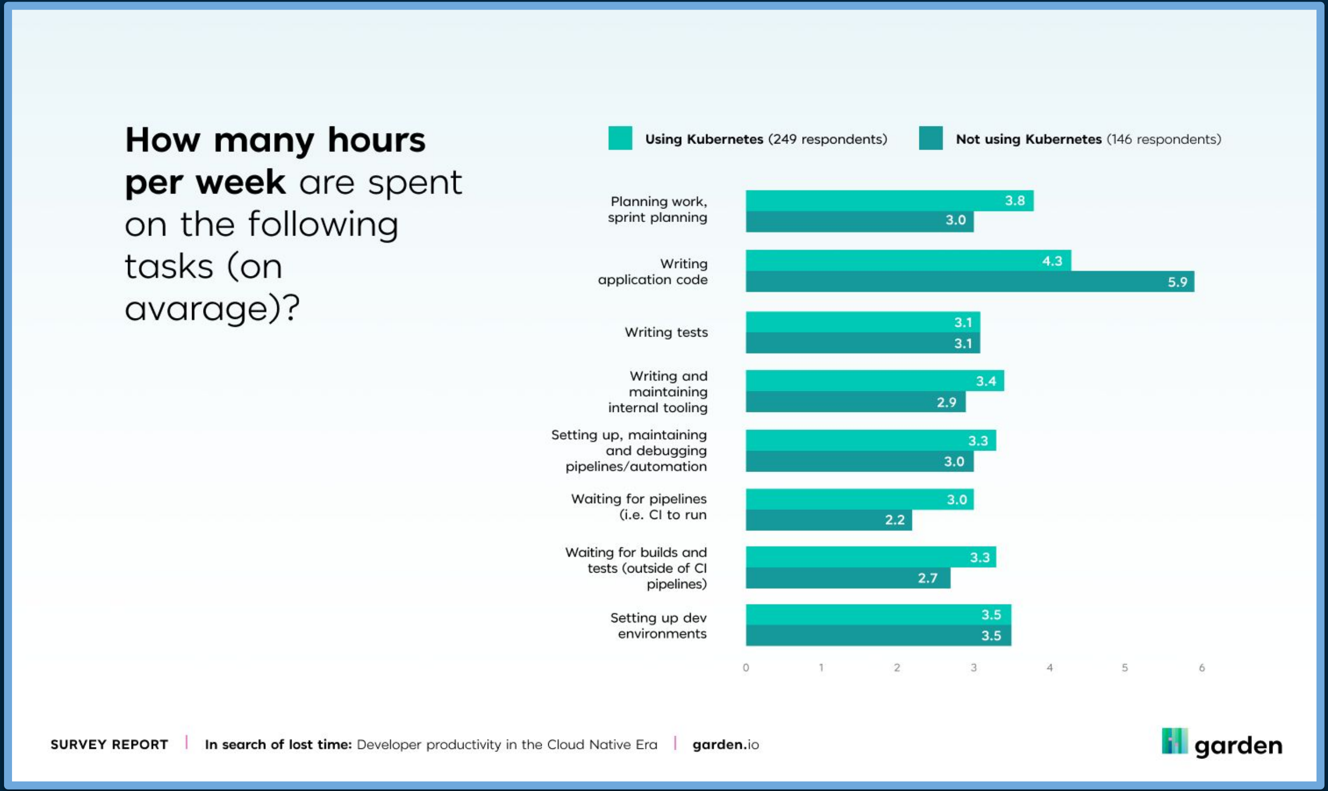
Container Challenges

This year, complexity joined cultural changes with the development team as the top challenges in using and deploying containers. Both were cited by 41% of respondents. Security (32%), which was second last year, slipped to third place, followed by storage (29%), and lack of training and monitoring (both at 27%).

What are your challenges in using/deploying containers? Please select all that apply

50%
40%
30%
20%
10%
0%
Complexity 41%
Cultural changes w/development 41%
Security 32%
Storage 29%
Lack of training 27%
Monitoring 27%
Networking 26%
Service Mesh 25%
Logging 22%
Scaling deployments based upon 20%
Difficulty in choosing an 14%
Reliability 12%
Other (please specify) 6%
Finding vendor support 5%

More time spent on most tasks if using Kubernetes



How many hours per week are spent on the following tasks (on avarage)?

SURVEY REPORT | **In search of lost time:** Developer productivity in the Cloud Native Era | **garden**.io

garden

So … what’s the solution ?

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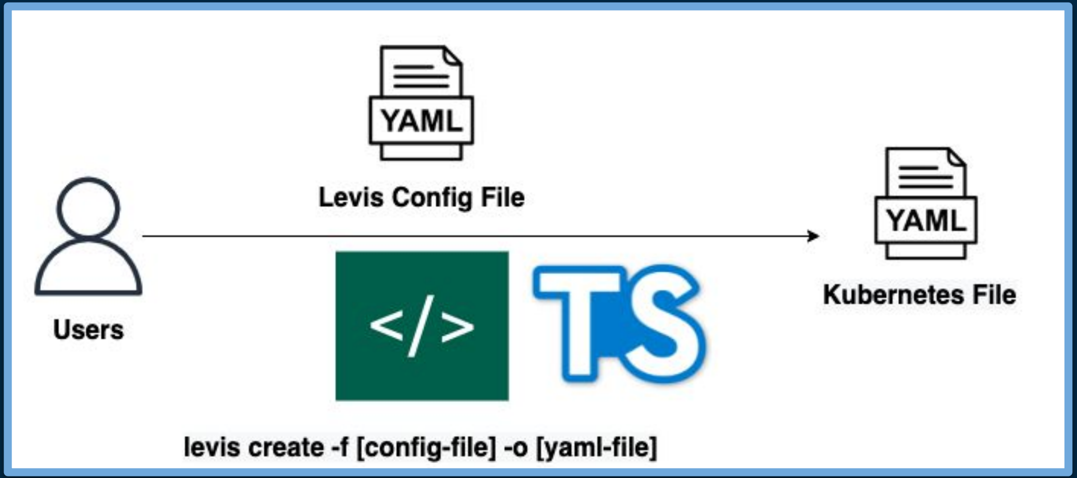
Our Needed vs Helm

Features	Our Needed	Helm
Usage	Configurable CLI tool which has **YAML file** as input and **output as Kubernetes YAML** file	There is no predefined helm template which matches to us and **we need to custom** it ourselves.
Customization	We need a template that can be **easy to custom** and straightforward	Some helm syntaxes are not straightforward as we inject our source code to yaml file. Our **customization is limitation**.
Maintainability	We would like a tool that can be **easy to maintain**	As helm syntaxes are not straightforward and it may be adding some **complexity in the future**.

Then .. we created our tool

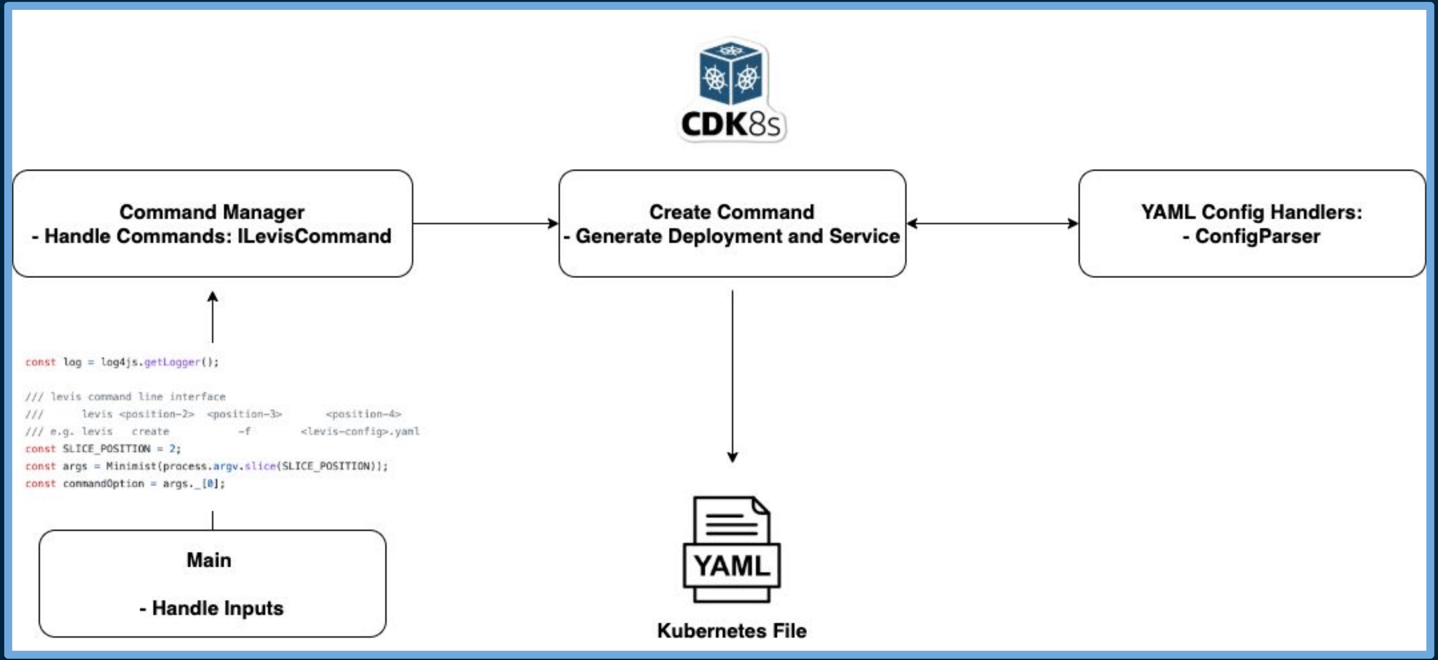


levis create -f [config-file] -o [yaml-file]

Levis

How do we created it?

Levis Architecture

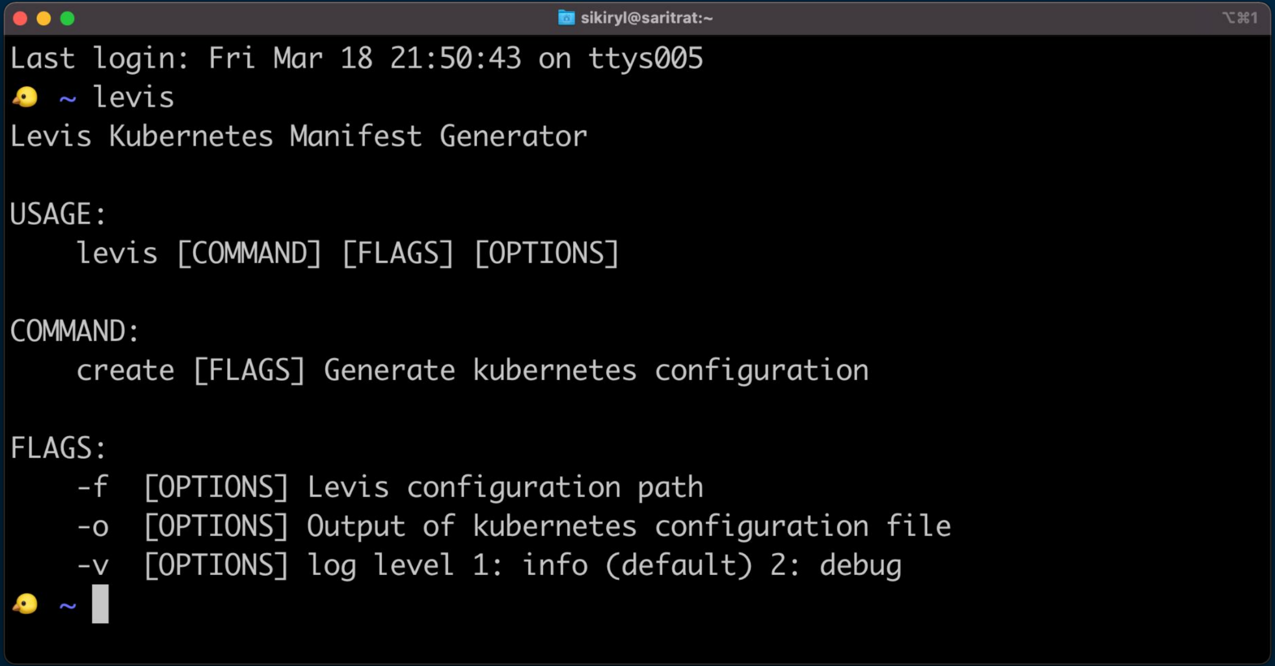


```
const log = log4js.getLogger();

/// levis command line interface
///       levis <position-2>  <position-3>       <position-4>
/// e.g. levis   create           -f        <levis-config>.yaml
const SLICE_POSITION = 2;
const args = Minimist(process.argv.slice(SLICE_POSITION));
const commandOption = args._[0];
```

Getting it installed

```
# Installing Levis (MacOS / Linux)


$ brew tap kubeopsskills/levis

$ brew install levis
```

How to use?

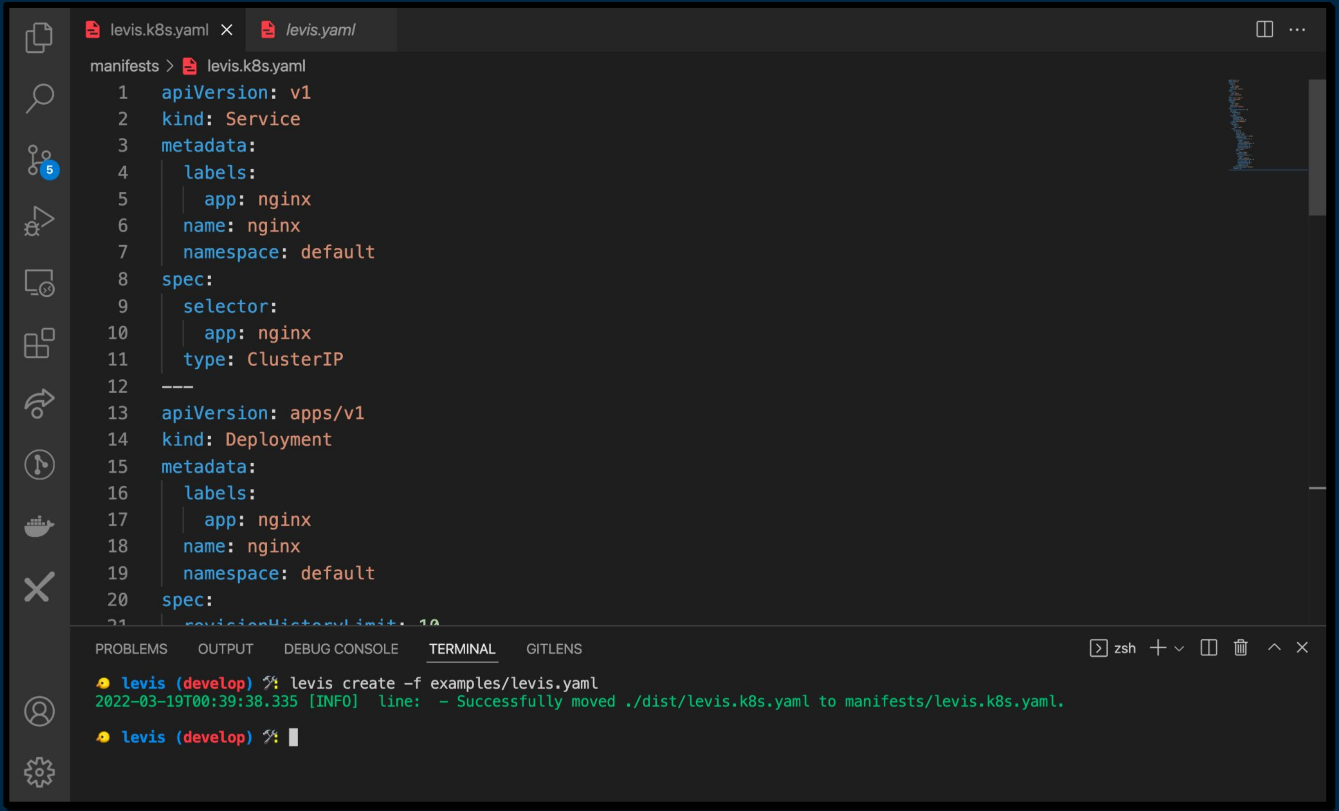


```
Last login: Fri Mar 18 21:50:43 on ttys005
🐥 ~ levis
Levis Kubernetes Manifest Generator

USAGE:
    levis [COMMAND] [FLAGS] [OPTIONS]

COMMAND:
    create [FLAGS] Generate kubernetes configuration

FLAGS:
    -f  [OPTIONS] Levis configuration path
    -o  [OPTIONS] Output of kubernetes configuration file
    -v  [OPTIONS] log level 1: info (default) 2: debug
🐥 ~ 
```

Configuring Levis: Only 7 Lines for Starters !

```
[levis.yaml]

levis:
 name: "nginx"
 deployment:
   containers:
     image: "nginx"
 service:
   enable: true
```

Run: levis create –f levis.yaml



```yaml
apiVersion: v1
kind: Service
metadata:
  labels:
    app: nginx
  name: nginx
  namespace: default
spec:
  selector:
    app: nginx
  type: ClusterIP
---
apiVersion: apps/v1
kind: Deployment
metadata:
  labels:
    app: nginx
  name: nginx
  namespace: default
spec:
  revisionHistoryLimit: 10
```

```
levis (develop) ⚒: levis create -f examples/levis.yaml
2022-03-19T00:39:38.335 [INFO]  line:  - Successfully moved ./dist/levis.k8s.yaml to manifests/levis.k8s.yaml.

levis (develop) ⚒: 
```

Other Use Cases – Examples

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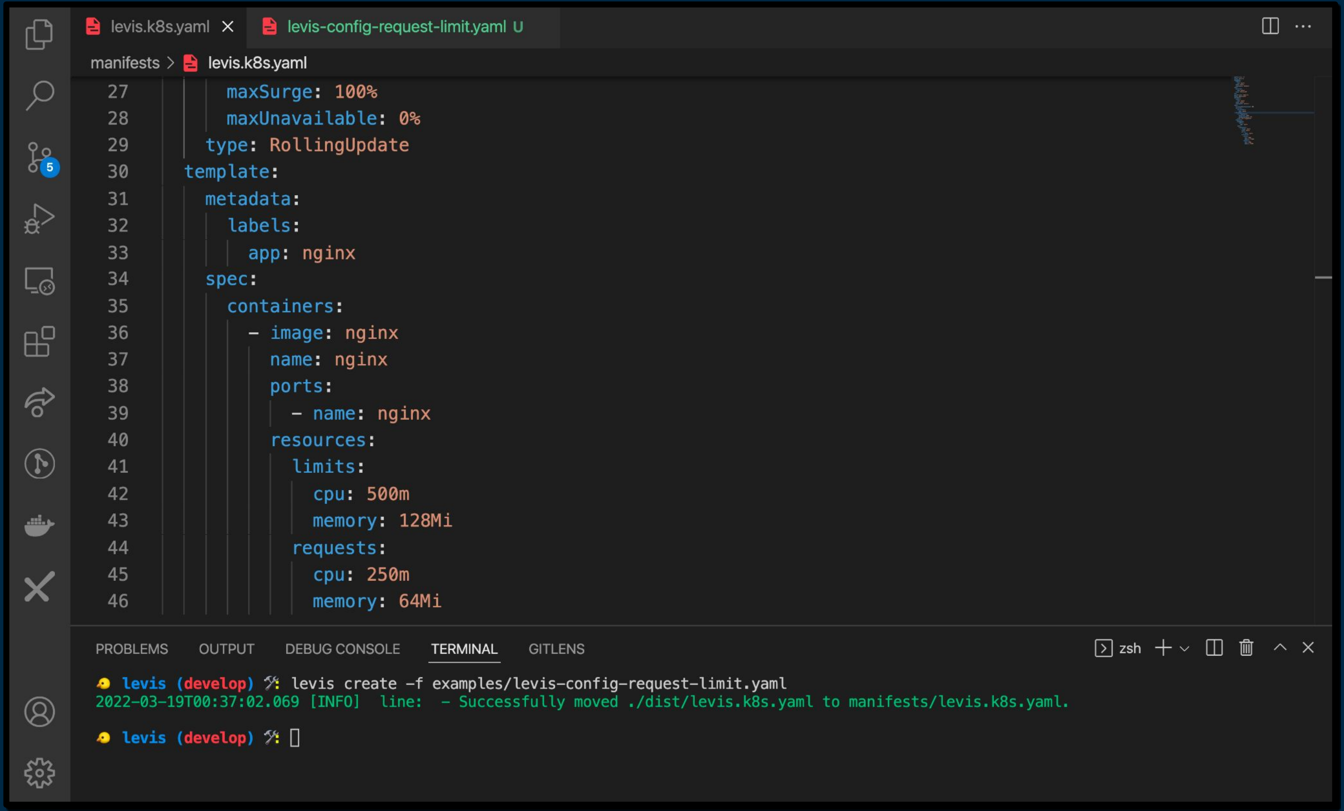
Configuring CPU & Memory

```
[levis.yaml]


deployment:
 containers:
  requests:
   cpu: 1Gi
   memory: 100Mi
  limits:
   cpu: 1Gi
   memory: 100Mi
```

Configuring CPU & Memory (Output)



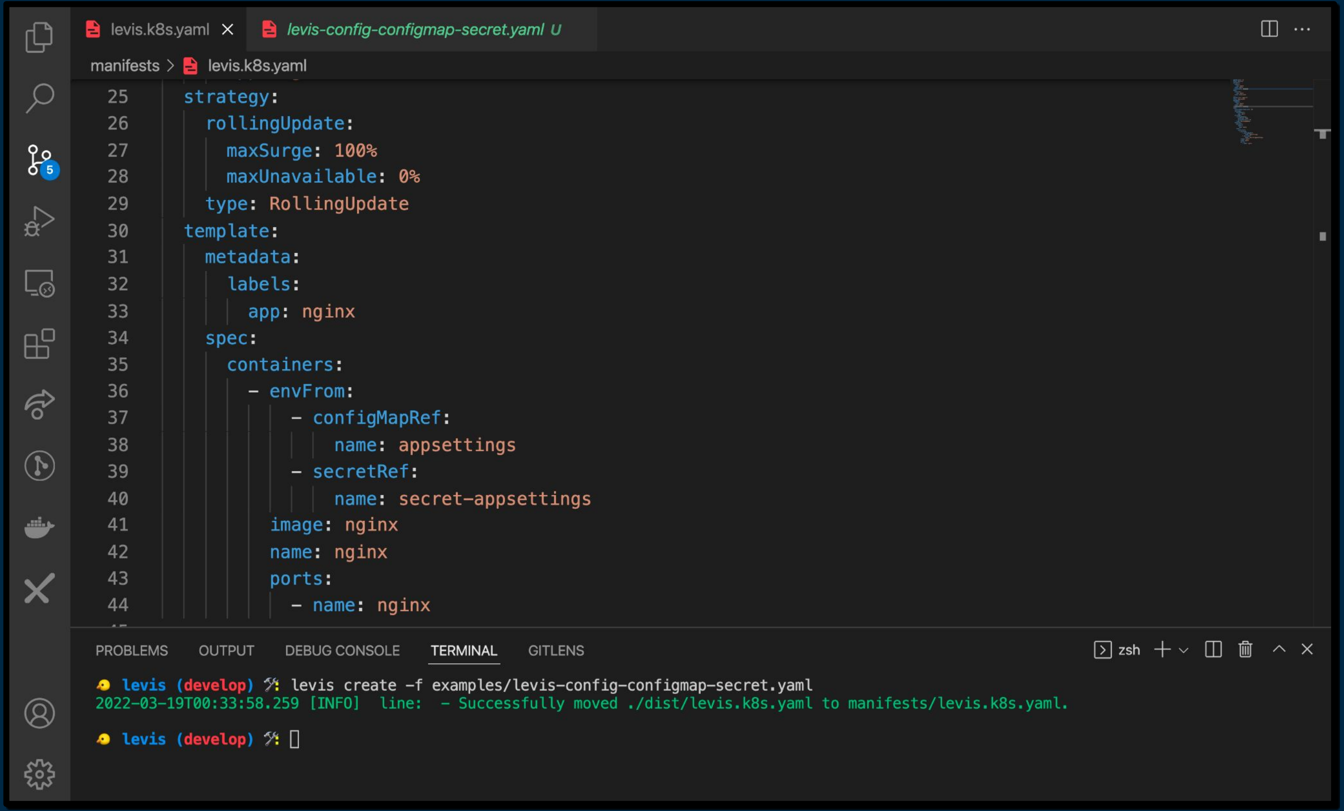
```yaml
      maxSurge: 100%
      maxUnavailable: 0%
    type: RollingUpdate
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - image: nginx
          name: nginx
          ports:
            - name: nginx
          resources:
            limits:
              cpu: 500m
              memory: 128Mi
            requests:
              cpu: 250m
              memory: 64Mi
```

```
levis (develop) 🛠 levis create -f examples/levis-config-request-limit.yaml
2022-03-19T00:37:02.069 [INFO]  line:  - Successfully moved ./dist/levis.k8s.yaml to manifests/levis.k8s.yaml.

levis (develop) 🛠
```

Application Configuration

```
[levis.yaml]


deployment:
 containers:
  env:
   app: nginx
  configEnvName: "appsettings"
  secretEnvName: "secret-appsettings"
```

Application Configuration (Output)


levis.k8s.yaml
levis-config-configmap-secret.yaml U
manifests > levis.k8s.yaml
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
GITLENS
zsh

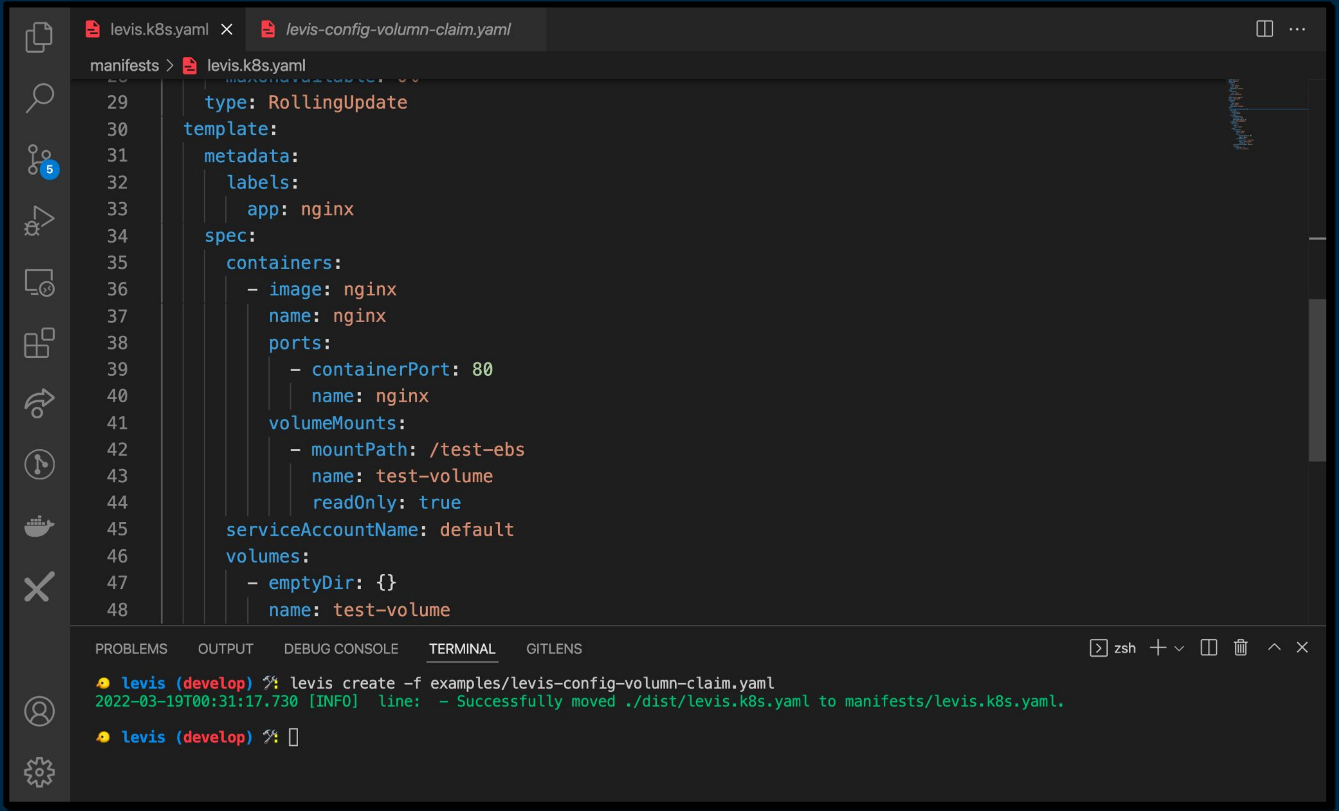
```yaml
  strategy:
    rollingUpdate:
      maxSurge: 100%
      maxUnavailable: 0%
    type: RollingUpdate
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - envFrom:
            - configMapRef:
                name: appsettings
            - secretRef:
                name: secret-appsettings
          image: nginx
          name: nginx
          ports:
            - name: nginx
```

```
levis (develop) ⚒ levis create -f examples/levis-config-configmap-secret.yaml
2022-03-19T00:33:58.259 [INFO]  line:  - Successfully moved ./dist/levis.k8s.yaml to manifests/levis.k8s.yaml.

levis (develop) ⚒
```

Configuring Volume Mounting

```
[levis.yaml]

volumeMounts:
- name: test-volume
  mountPath: /test-ebs
  readOnly: true
  secretName: test
```

Configuring Volume Mounting (Output)



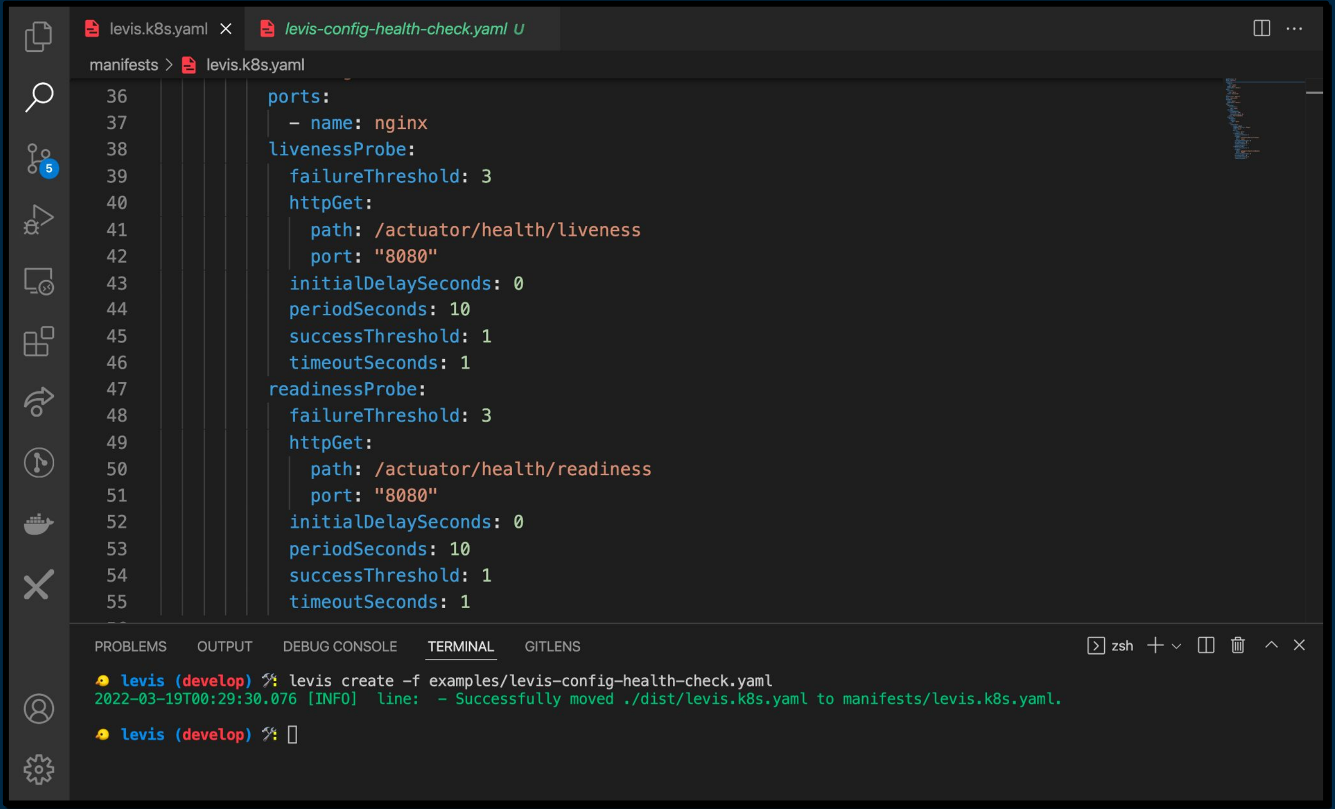
```yaml
    type: RollingUpdate
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - image: nginx
          name: nginx
          ports:
            - containerPort: 80
              name: nginx
          volumeMounts:
            - mountPath: /test-ebs
              name: test-volume
              readOnly: true
      serviceAccountName: default
      volumes:
        - emptyDir: {}
          name: test-volume
```

```
🐣 levis (develop) ⚒️ levis create -f examples/levis-config-volumn-claim.yaml
2022-03-19T00:31:17.730 [INFO]  line:  - Successfully moved ./dist/levis.k8s.yaml to manifests/levis.k8s.yaml.

🐣 levis (develop) ⚒️ ▯
```

Configuring Liveness and Readiness Probes

```
[levis.yaml]

livenessProbe:
  path: /actuator/health/liveness
  port: "8080"
readinessProbe:
  path: /actuator/health/readiness
  port: "8080"
```

Configuring Liveness and Readiness Probes (Output)



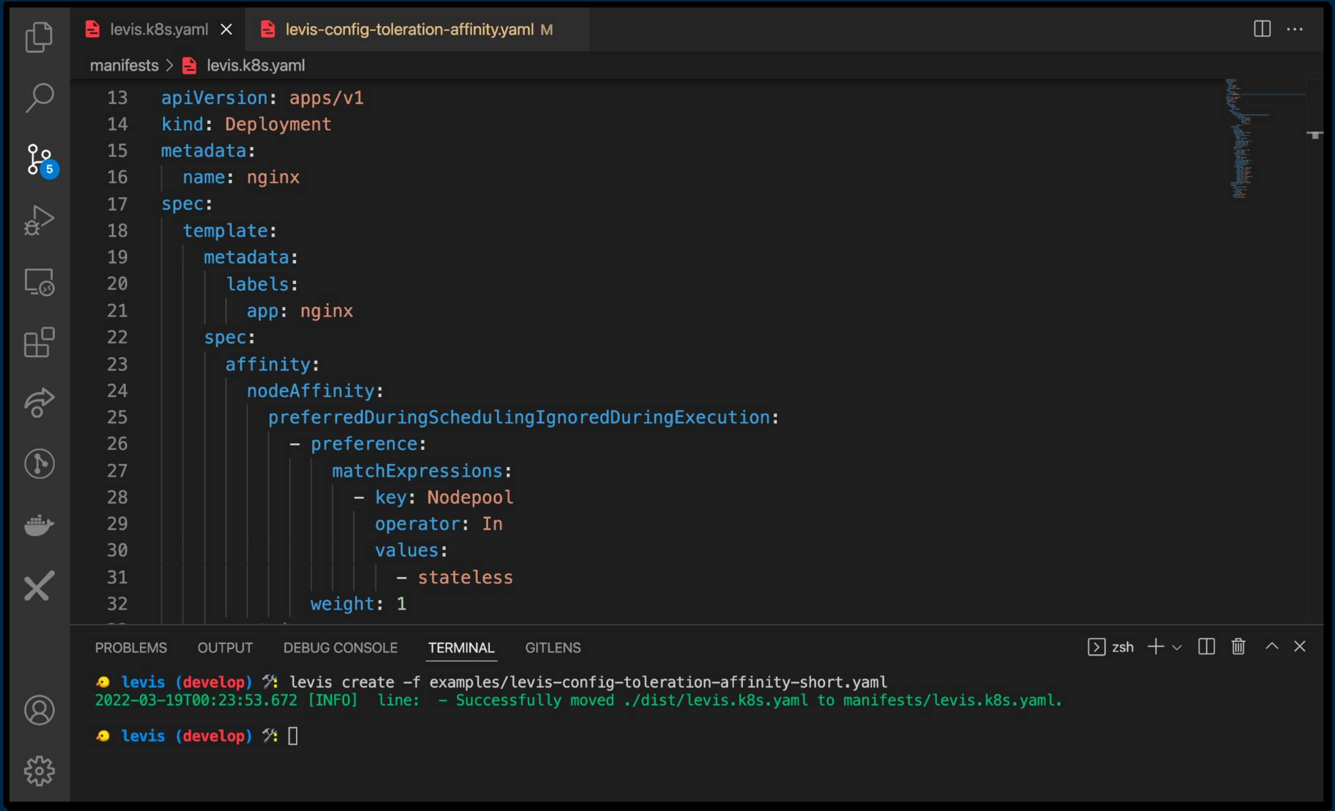
```yaml
          ports:
            - name: nginx
          livenessProbe:
            failureThreshold: 3
            httpGet:
              path: /actuator/health/liveness
              port: "8080"
            initialDelaySeconds: 0
            periodSeconds: 10
            successThreshold: 1
            timeoutSeconds: 1
          readinessProbe:
            failureThreshold: 3
            httpGet:
              path: /actuator/health/readiness
              port: "8080"
            initialDelaySeconds: 0
            periodSeconds: 10
            successThreshold: 1
            timeoutSeconds: 1
```

```
levis (develop) ⚒ levis create -f examples/levis-config-health-check.yaml
2022-03-19T00:29:30.076 [INFO]  line:  - Successfully moved ./dist/levis.k8s.yaml to manifests/levis.k8s.yaml.

levis (develop) ⚒
```

Configuring Nodes

```
[levis.yaml]


node:
  selector:
    mode: prefer
    operator: In
    labels:
      Nodepool: stateless
```

Configuring Nodes (Output)


levis.k8s.yaml
levis-config-toleration-affinity.yaml M
manifests > levis.k8s.yaml
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
GITLENS
zsh

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx
spec:
  template:
    metadata:
      labels:
        app: nginx
    spec:
      affinity:
        nodeAffinity:
          preferredDuringSchedulingIgnoredDuringExecution:
            - preference:
                matchExpressions:
                  - key: Nodepool
                    operator: In
                    values:
                      - stateless
              weight: 1
```

```
levis (develop) ⚒ levis create -f examples/levis-config-toleration-affinity-short.yaml
2022-03-19T00:23:53.672 [INFO]  line:  - Successfully moved ./dist/levis.k8s.yaml to manifests/levis.k8s.yaml.

levis (develop) ⚒ ▯
```

DEMO

Why do we give this back to community?

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Community is a great place which we can grow together

- As Kubernetes is an emerging technology, if we have a **great tool** which helps to getting started in Kubernetes in fast. **It’s much impact**.

- We would like to **share our pain points and solutions** to the community to see if those people is facing with the same things and gather feedbacks on our solutions

- **Working with the community is a good journey** to grow our project in rapid, because any Software Engineers around the world can contribute on the project and share improvement idea.

Q & A

- 100% Work Remotely
- Passionate
- Board Game Party
- Cloud Native Culture
- Work Hard Play Harder

Contact Us

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Thank you for your Attention

KubeOps

skills

X

<DEV>

MOUNTAIN

TECH FESTIVAL