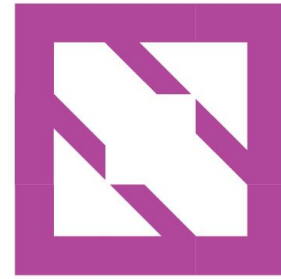


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Cloud Solutions Architect | Cloud Native Engineer
Hoon Jo@Megazone



Deploy a workload?



k8s in wonderland



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```
$ kubectl apply -f - <<EOF
apiVersion: v1
kind: Pod
metadata:
  name: po-nginx
spec:
  containers:
  - name: nginx
    image: nginx
EOF
pod/po-nginx created
```



```
$ k get po -o yaml
apiVersion: v1
kind: Pod
metadata:
  name: po-nginx
[snipped]
spec:
  containers:
  - image: nginx
    imagePullPolicy: Always
    name: nginx
[snipped]
enableServiceLinks: true
nodeName: w3-k8s
preemptionPolicy: PreemptLowerPriority
priority: 0
restartPolicy: Always
schedulerName: default-scheduler
securityContext: {}
serviceAccount: default
serviceAccountName: default
terminationGracePeriodSeconds: 30
[snipped]
```

Down the Kubernetes Hole

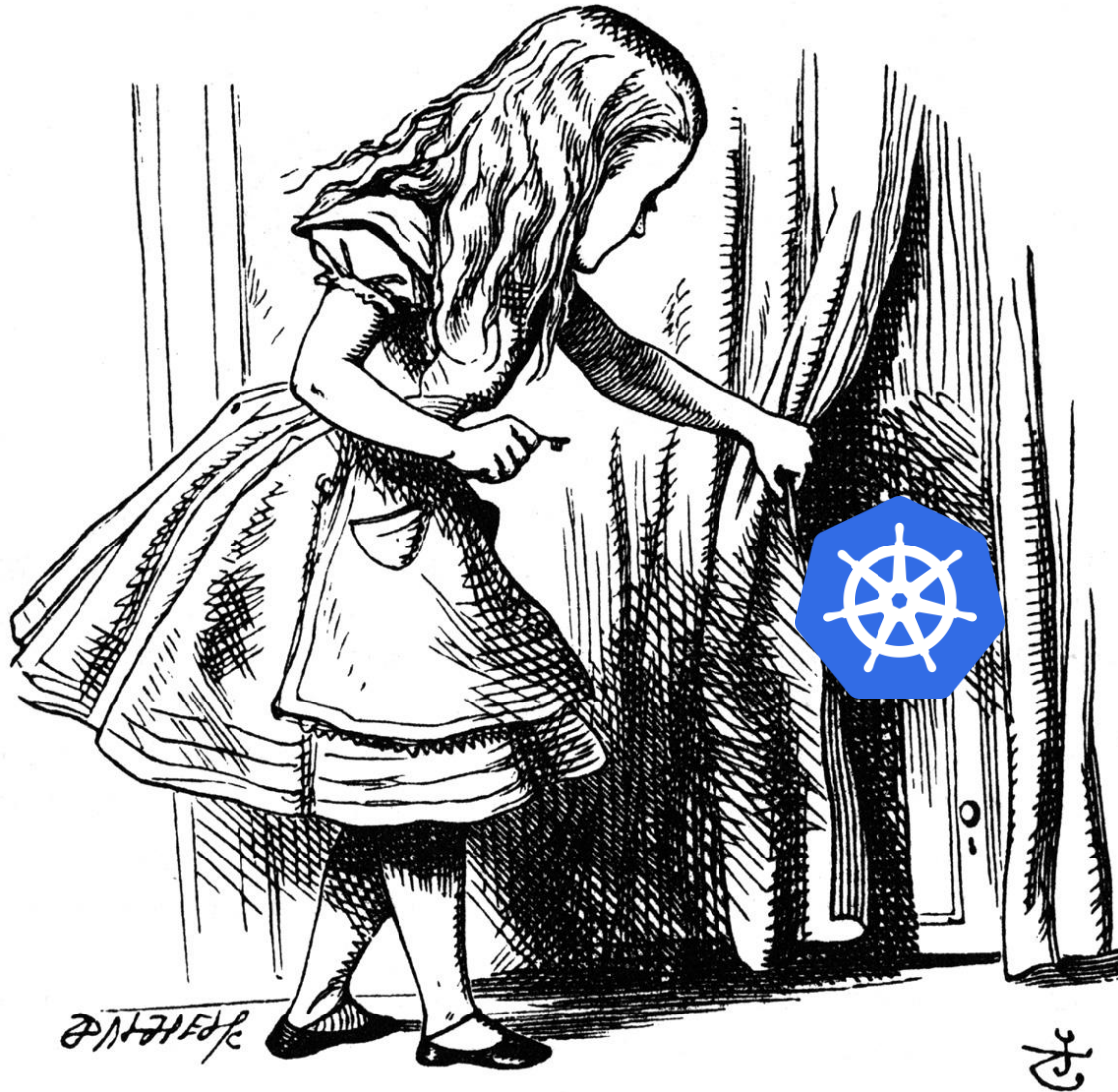


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**Alice finding tiny
“Kubernetes” behind curtain**



Who am I ?



<https://github.com/SysNet4Admin>



<https://www.linkedin.com/in/hoonjo/>



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A collage of colorful geometric shapes and icons arranged in a grid-like pattern. The icons include a yellow sun, a green circle, a yellow grid, a pink star, a teal square, a red clock tower, a blue teapot, a purple square with a white star, a yellow heart, a blue dome, a red lamp, and various other geometric shapes like squares, triangles, and circles in different colors. The overall style is modern and abstract.

po-default-imagepullpolicy-always.yaml



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```
...Pod-containers-imagePullPolicy#  
↳ cat po-default-imagepullpolicy-always.yaml  
apiVersion: v1  
kind: Pod  
metadata:  
  labels:  
    run: po-imagepullpolicy-default-always  
    name: po-imagepullpolicy-default-always  
spec:  
  containers:  
  - image: sysnet4admin/kubecon-eu  
    name: nginx  
  nodeName: w1-k8s
```



```
...Pod-containers-imagePullPolicy# k get po -o yaml
```

```
apiVersion: v1  
kind: Pod  
[snipped]  
spec:  
  containers:  
  - image: sysnet4admin/kubecon-eu  
    imagePullPolicy: Always  
    name: nginx  
  [snipped]  
  dnsPolicy: ClusterFirst  
  enableServiceLinks: true  
  nodeName: w1-k8s  
  preemptionPolicy: PreemptLowerPriority  
  priority: 0  
  restartPolicy: Always  
  schedulerName: default-scheduler  
  securityContext: {}  
  serviceAccount: default  
  serviceAccountName: default  
  terminationGracePeriodSeconds: 30
```

✓ Always (*)
✓ IfNotPresent
✓ Never

✓ Always (*)
✓ Never
✓ OnFailure

✓ 30 (*)
✓ integer

DEMO: fall down “kubectl explain”



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If you are language huddle, k8sGPT will help

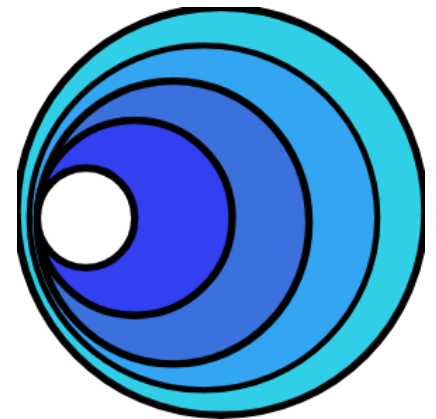
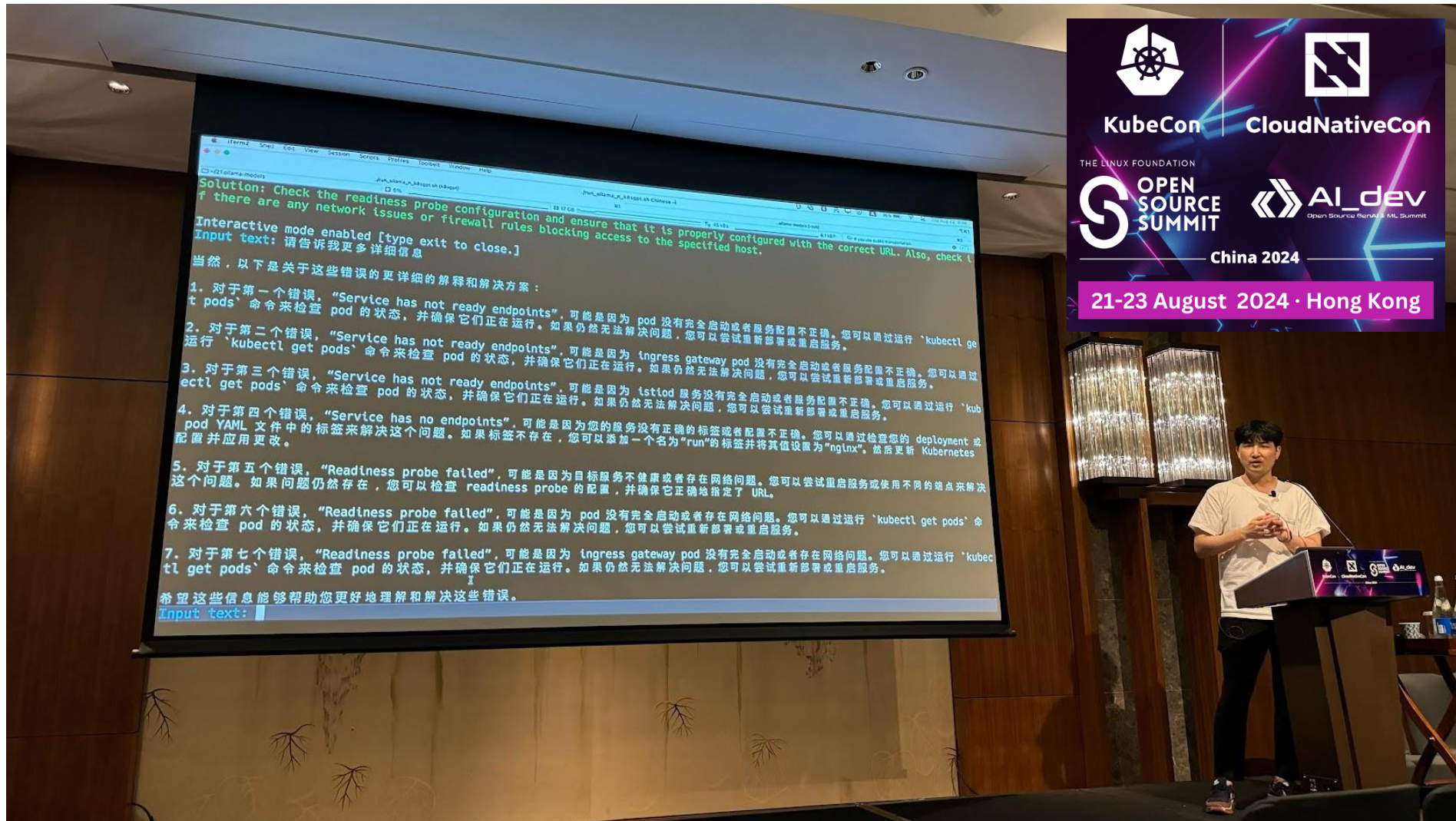


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K8SGPT



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PART II - Pod

with Unknown Code



po-default-imagepullpolicy-always.yaml



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```
...Pod-containers-imagePullPolicy#  
↳ cat po-default-imagepullpolicy-always.yaml  
apiVersion: v1  
kind: Pod  
metadata:  
  labels:  
    run: po-imagepullpolicy-default-always  
    name: po-imagepullpolicy-default-always  
spec:  
  containers:  
  - image: sysnet4admin/kubecon-eu  
    name: nginx  
  nodeName: w1-k8s
```



...Pod-containers-imagePullPolicy# **k get po -o yaml**

```
apiVersion: v1  
kind: Pod  
[snipped]  
spec:  
  containers:  
  - image: sysnet4admin/kubecon-eu  
    imagePullPolicy: Always  
    name: nginx  
  [snipped]  
  dnsPolicy: ClusterFirst  
  enableServiceLinks: true  
  nodeName: w1-k8s  
  preemptionPolicy: PreemptLowerPriority  
  priority: 0  
  restartPolicy: Always  
  schedulerName: default-scheduler  
  securityContext: {}  
  serviceAccount: default  
  serviceAccountName: default  
  terminationGracePeriodSeconds: 30  
  [snipped]
```

✓ Always (*)
✓ IfNotPresent
✓ Never

✓ Always (*)
✓ Never
✓ OnFailure

✓ 30 (*)
✓ integer

imagePullPolicy flowchart

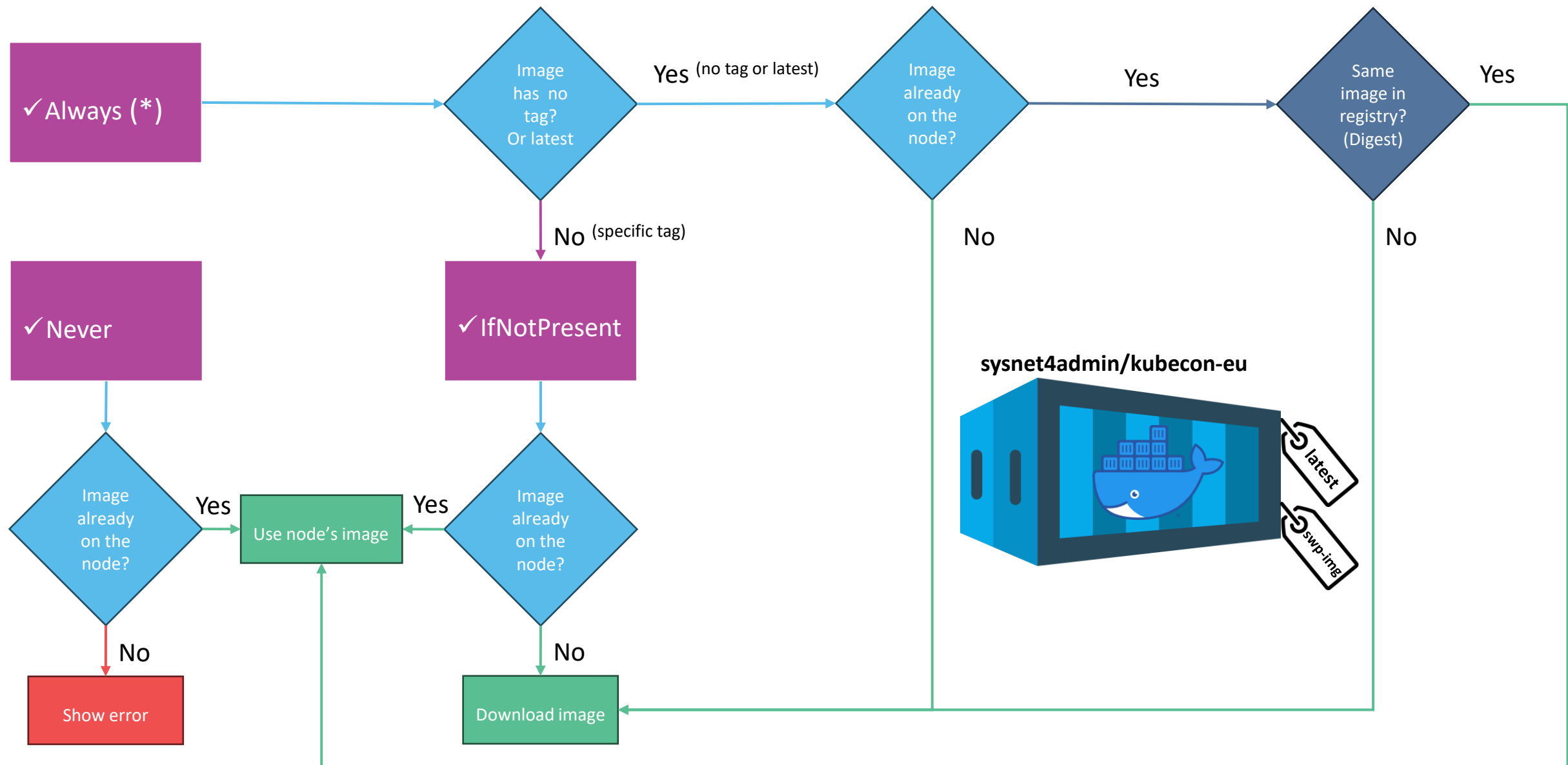


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DEMO: pod.spec.containers.imagePullPolicy



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PART III - Deployment

with Unknown Code



deploy-default-rollingupdate-maxsurge25.yaml



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```
...Deployment-strategy-rollingUpdate-maxSurge#  
↪ cat deploy-default-rollingupdate-maxsurge25.yaml  
apiVersion: apps/v1  
kind: Deployment  
metadata:  
  labels:  
    app: deploy-default-rollingupdate-maxsurge25  
  name: deploy-default-rollingupdate-maxsurge25  
spec:  
  replicas: 10  
  selector:  
    matchLabels:  
      app: deploy-default-rollingupdate-maxsurge25  
  template:  
    metadata:  
      labels:  
        app: deploy-default-rollingupdate-maxsurge25  
    spec:  
      containers:  
        - name: nginx-max25  
          image: quay.io/nginx/nginx-unprivileged:1.26.2  
          ports:  
            - containerPort: 8080
```



```
...Deployment-strategy-rollingUpdate-maxSurge#  
↪ k get deploy -o yaml  
apiVersion: apps/v1  
kind: Deployment  
[snipped]  
spec:  
  progressDeadlineSeconds: 600  
  replicas: 10  
  revisionHistoryLimit: 10  
  selector:  
    matchLabels:  
      app: deploy-default-rollingupdate-maxsurge25  
  strategy:  
    rollingUpdate:  
      maxSurge: 25%  
      maxUnavailable: 25%  
    type: RollingUpdate  
[snipped]
```

Annotations for the right box:

- For `progressDeadlineSeconds: 600`:
 - ✓ 600 (*)
 - ✓ Integer
- For `revisionHistoryLimit: 10`:
 - ✓ 10 (*)
 - ✓ Integer
- For `maxSurge: 25%`:
 - ✓ 25% (*)
 - ✓ IntOrString

maxSurge Calculation

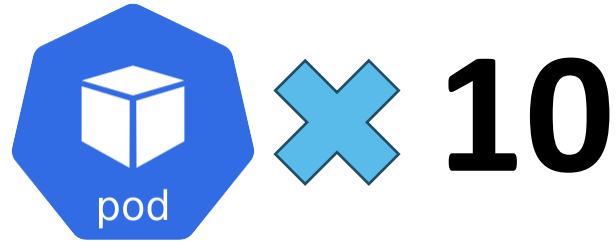


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maxSurge: 10%



maxSurge: 25%



maxSurge: 80%



Slow

Fast

rollingUpdate

Low

High

Overhead

DEMO: `deploy.spec.strategy.rollingUpdate.maxSurge`



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PART IV - Service

with Unknown Code



svc-lb-default-sessionaffinity-none.yaml



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```
...Service-sessionAffinity#  
↪ cat svc-lb-default-sessionaffinity-none.yaml  
apiVersion: v1  
kind: Service  
metadata:  
  name: svc-lb-default-sessionaffinity-none  
spec:  
  selector:  
    app: chk-ip  
  ports:  
    - name: http  
      port: 80  
      targetPort: 80  
  type: LoadBalancer
```



...Service-sessionAffinity# **k get svc -o yaml**

```
apiVersion: v1  
kind: Service  
[snipped]  
spec:  
  allocateLoadBalancerNodePorts: true  
  clusterIP: 10.98.152.234  
  clusterIPs:  
    - 10.98.152.234  
  externalTrafficPolicy: Cluster  
  internalTrafficPolicy: Cluster  
  ipFamilies:  
    - IPv4  
  ipFamilyPolicy: SingleStack  
  ports:  
  [snipped]  
  selector:  
    app: chk-ip  
    sessionAffinity: None  
  type: LoadBalancer  
status:  
  loadBalancer: {}
```

Annotations for externalTrafficPolicy and internalTrafficPolicy:

- ✓ Local
- ✓ Cluster (*)

Annotations for ipFamilyPolicy:

- ✓ PreferDualStack
- ✓ RequireDualStack
- ✓ SingleStack (*)

Annotations for sessionAffinity:

- ✓ None (*)
- ✓ ClientIP

sessionAffinity (a.k.a., sticky or persistence session)

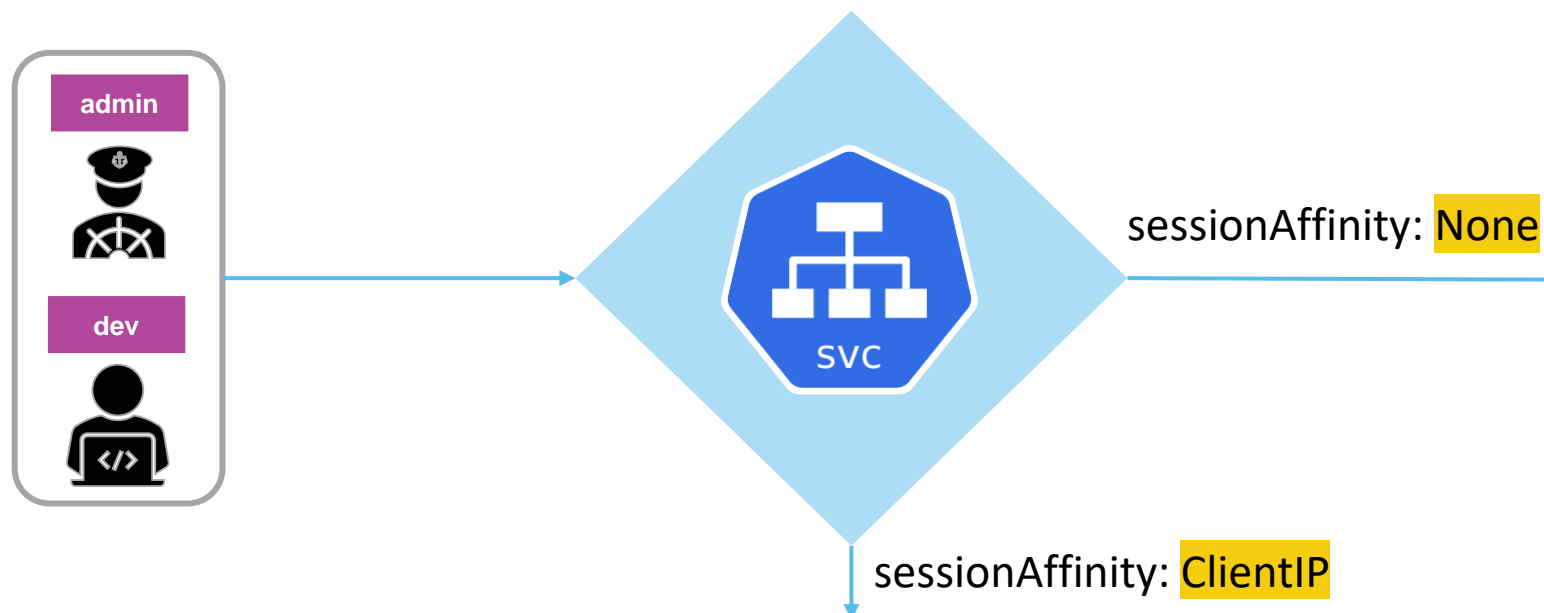


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Reply back from **all** endpoints

```
$ curl_get.sh <IP>
```

[snipped]

39 - request_method : GET | ip_dest: 172.16.132.5

40 - request_method : GET | ip_dest: 172.16.132.5

41 - request_method : GET | ip_dest: 172.16.132.5

42 - request_method : GET | ip_dest: 172.16.103.136

43 - request_method : GET | ip_dest: 172.16.132.5

44 - request_method : GET | ip_dest: 172.16.103.137

45 - request_method : GET | ip_dest: 172.16.103.136

[snipped]

Reply back from **only one** endpoint

```
$ curl_get.sh <IP>
```

[snipped]

39 - request_method : GET | ip_dest: 172.16.103.137

40 - request_method : GET | ip_dest: 172.16.103.137

41 - request_method : GET | ip_dest: 172.16.103.137

42 - request_method : GET | ip_dest: 172.16.103.137

[snipped]

DEMO: service.spec.sessionAffinity



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PART V - Recap+



Down the Kubernetes Hole: “Default”

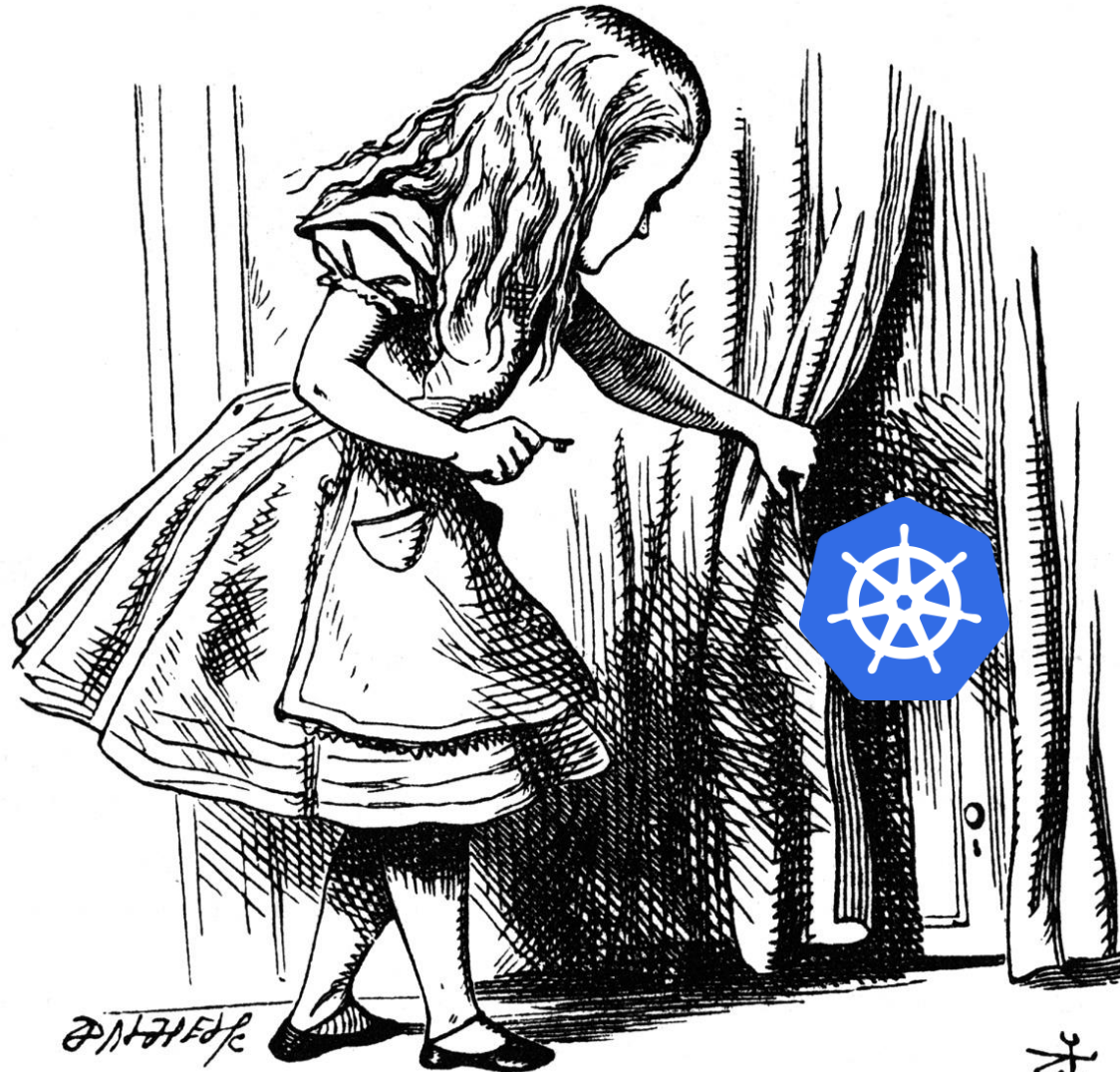


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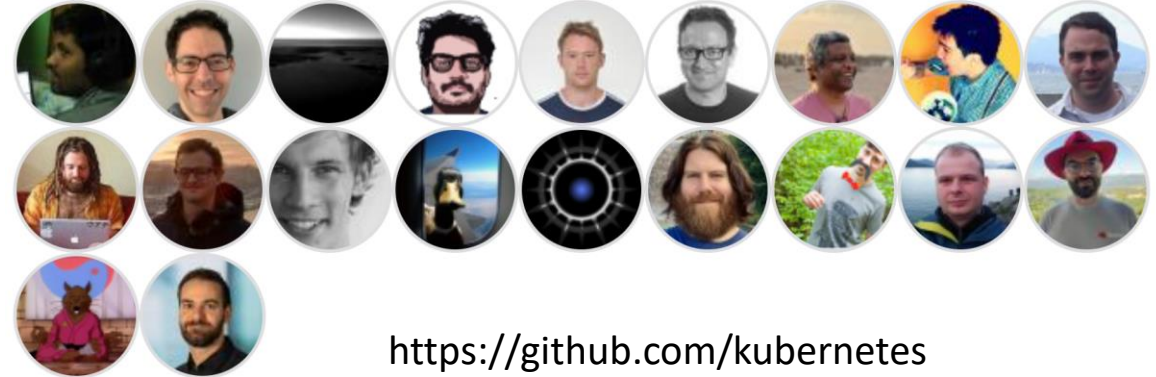


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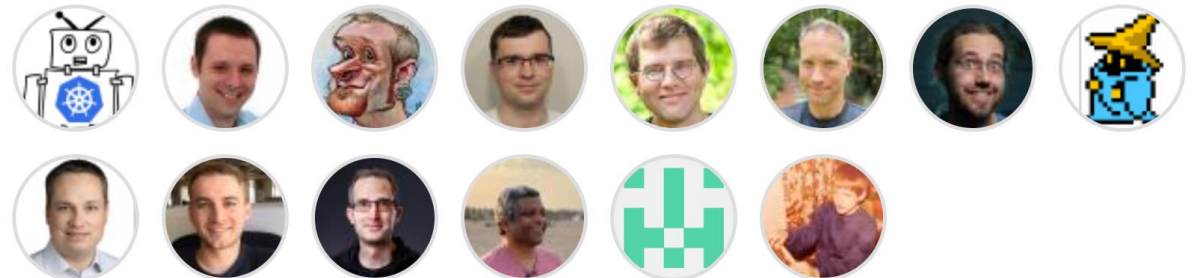
People



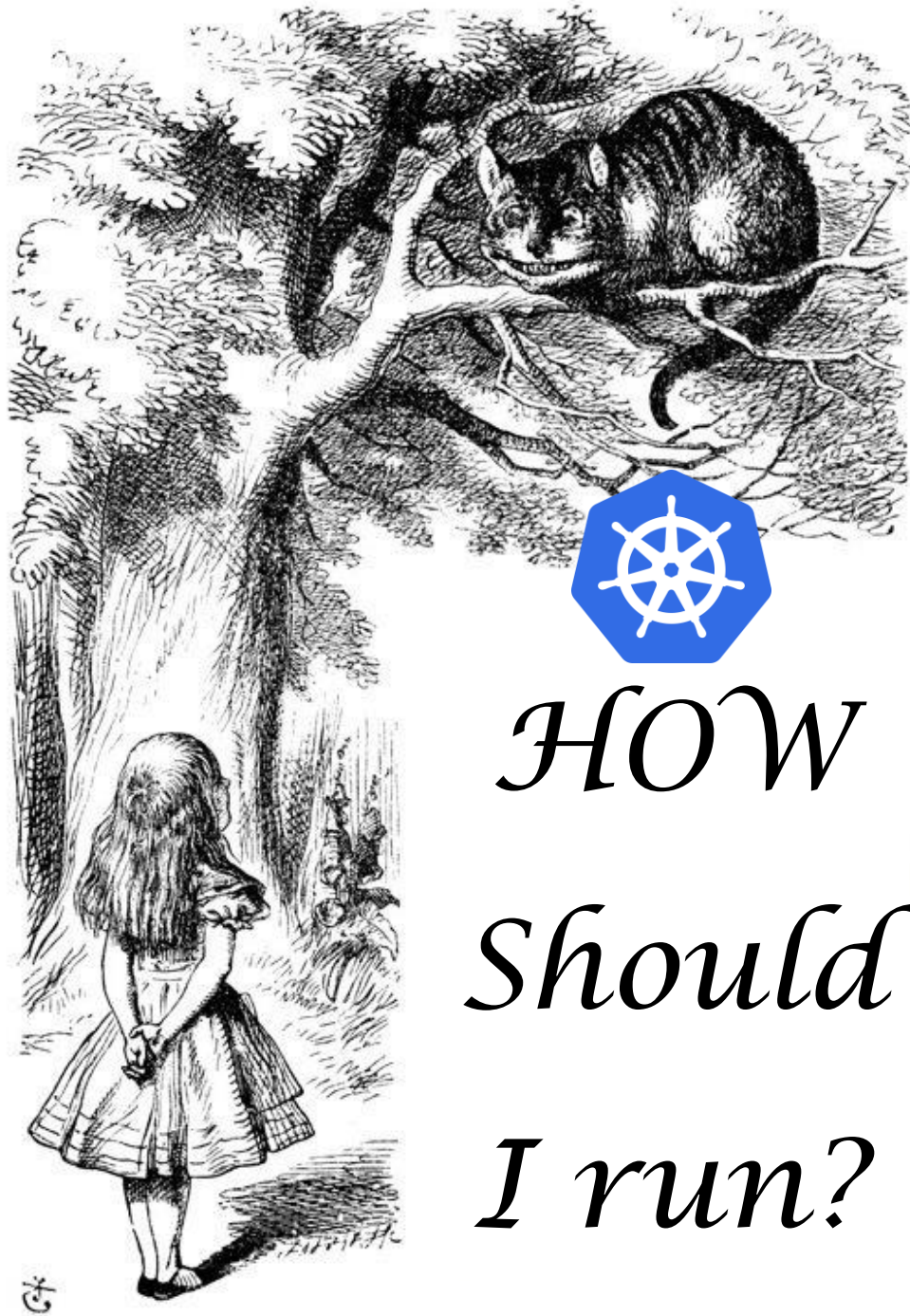
<https://github.com/kubernetes>

[View all](#)

Contributors 3,761



[+ 3,747 contributors](https://github.com/kubernetes/kubernetes) <https://github.com/kubernetes/kubernetes>



How Should I run?

"Alice: Would you tell me, please, which way I ought to go from here?"

The Cheshire Cat: That depends a good deal on where you want to get to.

Alice: I don't much care where.

The Cheshire Cat: Then it doesn't much matter which way you go.

Alice: ...So long as I get somewhere.

The Cheshire Cat: Oh, you're sure to do that, **if only you walk long enough."**

Any Questions?

KubeCon EU 2025's doc

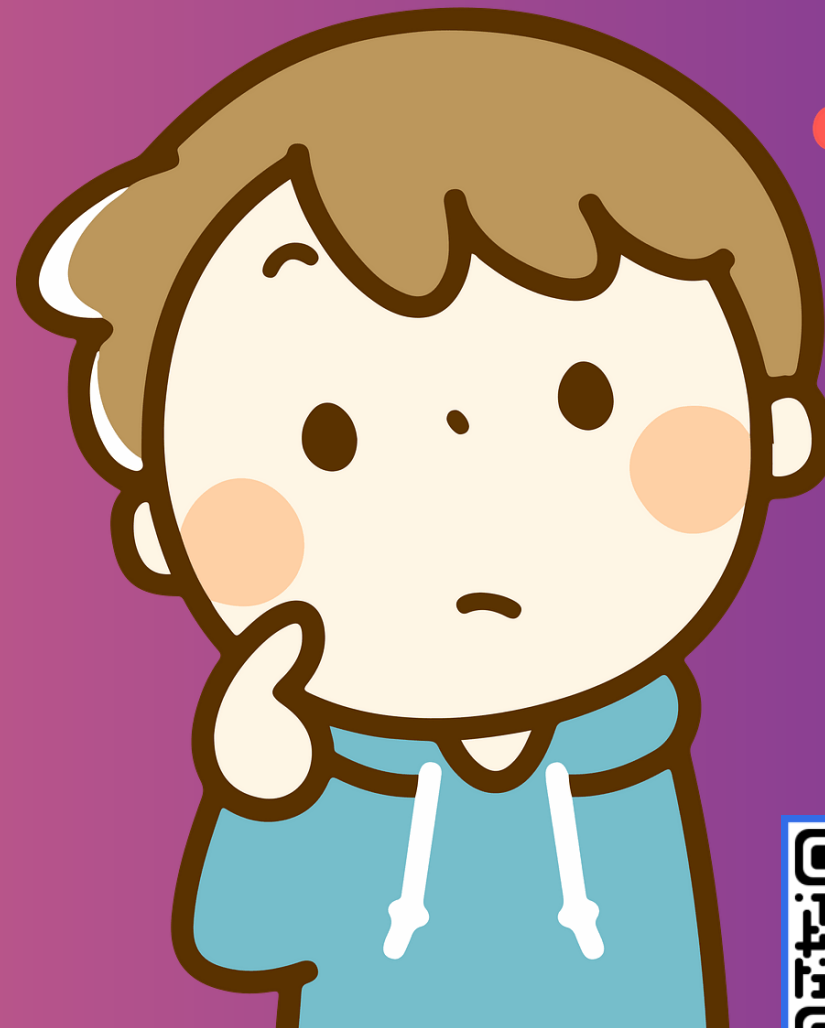
[DEMO] Unknown Code in k8s

- ShortURL: <https://m.site.naver.com/1BjHX>



[Video] KubeCon China 2024_k8sGPT+ollama

- ShortURL: <https://m.site.naver.com/1Bjw6>



<https://github.com/SysNet4Admin>



<https://www.linkedin.com/in/hoonjo/>