

CNCF LINZ A TALE OF ROSES AND CONTAINERS: OUR KUBERNETES JOURNEY

26.03.2024 - Pasching

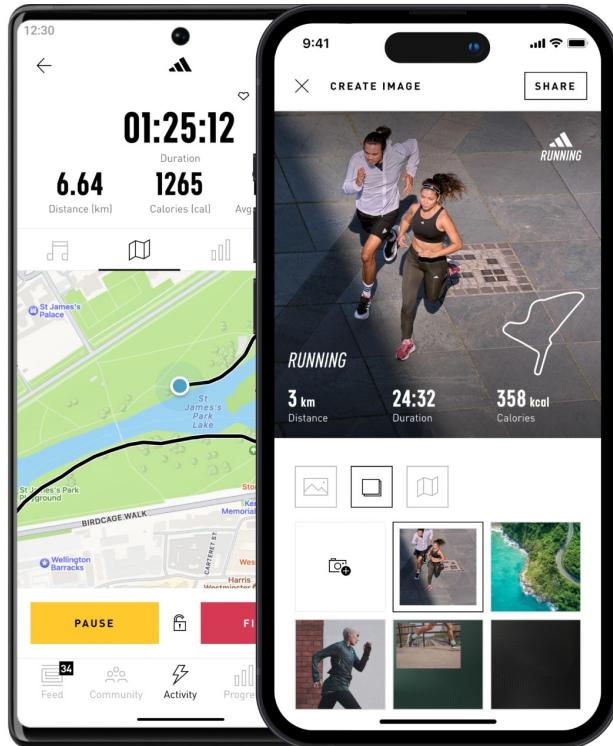


ABOUT US



ABOUT US

BUILDING DIGITAL SPORTS EXPERIENCES FOR ADIDAS



ALEXANDER LACKNER

INFRASTRUCTURE ENGINEER



- JOINED ADIDAS RUNTASTIC IN MARCH 2020
- PASSIONATE ABOUT AUTOMATION AND CLOUD COMPUTING
- LOVES TO RUN, HIKE AND GAME 🎮

ADIDAS AG



ARMIN DELIOMINI

HEAD OF INFRASTRUCTURE



- JOINED (ADIDAS) RUNTASTIC IN JANUARY 2013
- PASSIONATE ABOUT OPEN SOURCE
- TOO OLD TO RUN, HIKE AND GAME 😊
- YOUNG ENOUGH TO BEAT ALEX IN TABLE TENNIS 🎾



CONTENT

- 1. HOW IT ALL STARTED**
- 2. OUR ROSE JOURNEY**
- 3. ADOPTING CLOUD NATIVE AND K8S**
- 4. THE FUTURE**
- 5. SUMMARY**

HOW IT ALL STARTED



HOW IT ALL STARTED

"SERVERS" WITH SURROUND SOUND

- **CHEAP 'N' EASY**
- **AUTOMATION FIRST STEPS**
- **DIRTY, DIRTY, DIRTY**
- **ROOT SERVER**
- **DESKTOP PC WITH DOLBY SURROUND SOUND**
- **MORE OR LESS CLOUD NATIVE STACK**



HOW IT ALL STARTED

OUR OWN DATACENTER - WE LOVED IT

- **WE LEARNED A LOT**
- **WE AUTOMATED A LOT**
- **WE BROKE A LOT**

- **OPENNEBULA (KVM)**
- **CHEF**
- **STATIC DEV ENVS**



HOW IT ALL STARTED

OUR OWN DATACENTER - WE MOVED IT

- **NO DOWNTIME MIGRATION**
 - migration via car ...
- **WE AUTOMATED A LOT**
- **AUTOMATED DEV ENVIRONMENTS**
- **SELF BUILT SOLUTION (RENO)**



OUR ROSE JOURNEY



**WHAT DO YOU THINK ROSE
STANDS FOR? 🤔**



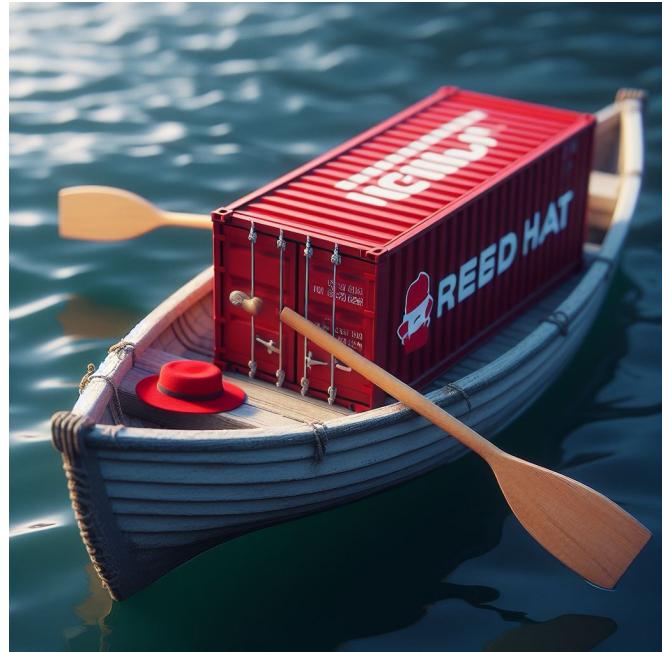
RUNTASTIC OPENSOURCE ENVIRONMENT



ROSE

RUNTASTIC OPENSHIFT ENVIRONMENT

- **OUR MOVE TO CONTAINERS**
- **KUBERNETES BUT ENTERPRISE - \$\$\$**
- **SLACK INTEGRATION :)**



ADOPTING CLOUD NATIVE AND K8S

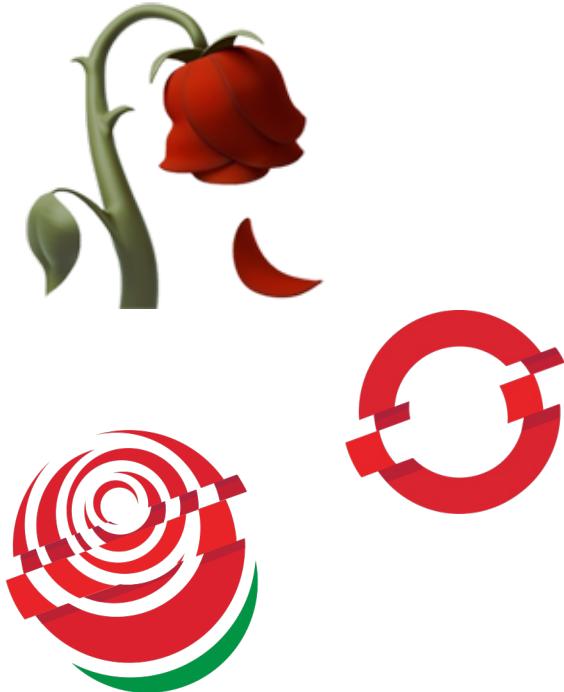


ADOPTING CLOUD NATIVE AND K8S



WHY MOVE ON?

- **STUCK ON OPENSHIFT 3.11**
 - Need to redeploy the whole cluster for 4.x
- **BARE-METAL SETUP**
- **NO PROPER AUTOMATION**
 - Ansible for updates which took forever



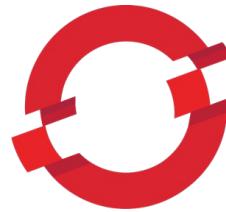
ADOPTING CLOUD NATIVE AND K8S



FIRST STEPS

- **CHECKING OUT THE LANDSCAPE**
- **SEARCHING FOR ALTERNATIVES**
 - OKD
 - Kubermatic
 - Giant Swarm
 - Kubespray
- **BUILDING A POC**

okd



ADOPTING CLOUD NATIVE AND K8S



SETUP WITH KUBERMATIC

- **WHY DID WE CHOOSE IT**

- Existing Hardware / support for on-premise
- Great community
- Integrates with open nebula platform → contribution
- Vanilla k8s with management UI
- Cilium support



ADIDAS AG

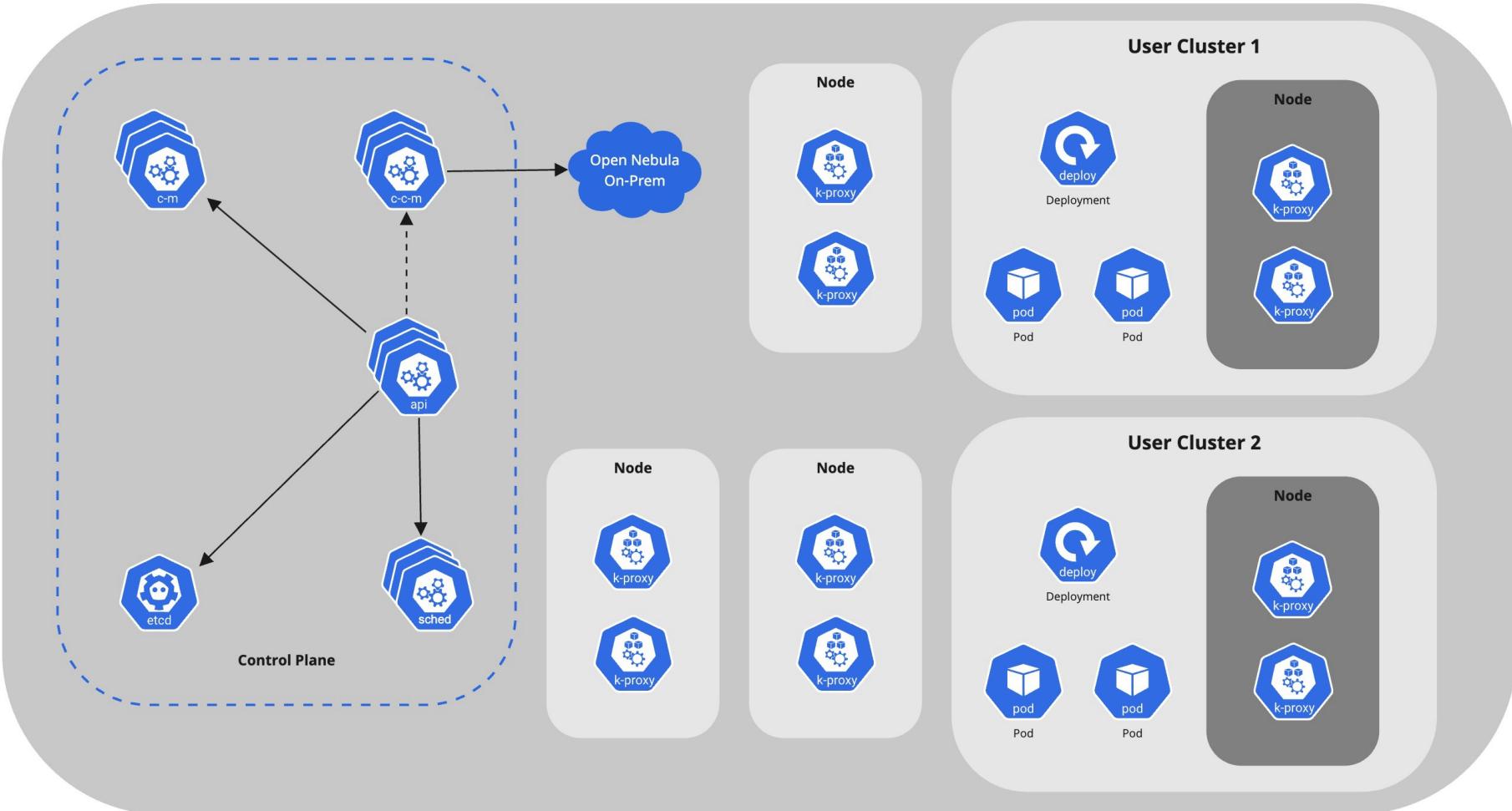
- **TWO MANAGEMENT CLUSTERS**



- **ONE USER CLUSTER PER ENVIRONMENT**



Management Cluster

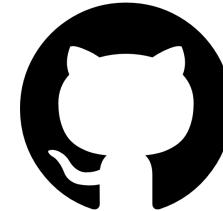
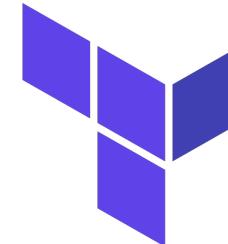


ADOPTING CLOUD NATIVE AND K8S



GITOPS & INFRASTRUCTURE AS CODE (IAC)

- **IAC: TERRAFORM**
- **GITOPS: FLUX**
- **UPDATES: GITHUB + RENOVATE**
- **DEV CI/CD: TEKTON**



ADOPTING CLOUD NATIVE AND K8S



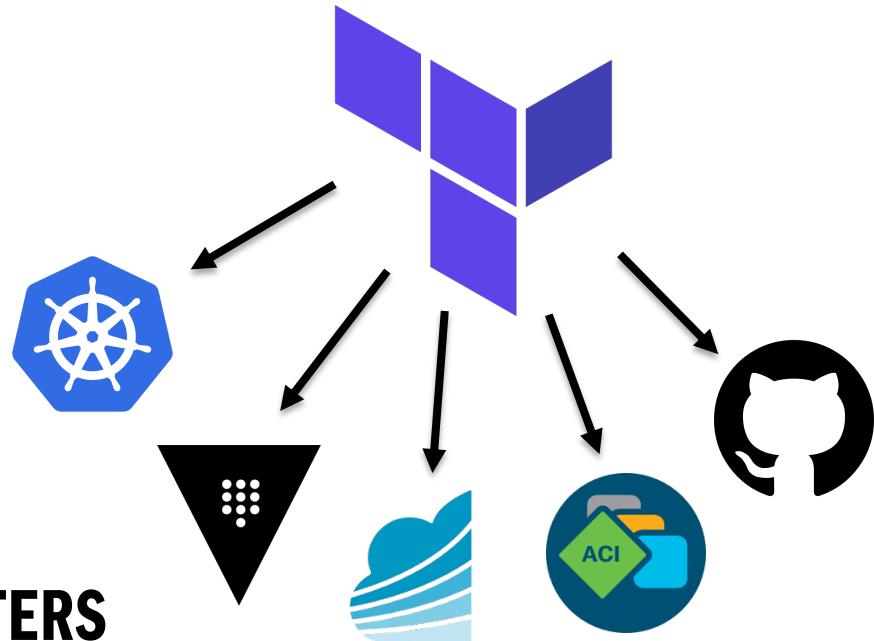
INFRASTRUCTURE AS CODE (IAC)

- **CUSTOM TERRAFORM MODULE**

- Kubernetes resources (cluster, ...)
- Private Cloud
- Networking
- Secrets and Permissions
- Repository files

- **46 VARIABLES**

- **CAN UPGRADE/SCALE K8S CLUSTERS**



ADOPTING CLOUD NATIVE AND K8S

INFRASTRUCTURE AS CODE (IAC)



```
● ● ● k8s-user-cluster.auto.tfvars

## The vlan that should be used
rt_network_vlan = "42"

## The ACI gateway IP in cidr notation
rt_network_subnet_gateway_ip = "10.42.42.254/24"

## Name of the k8s management cluster (k8s or k8stest)
rt_management_cluster_name = "k8stest"

## Short name of the k8s user cluster
rt_cluster_name_short = "bob"

## Cluster Version
rt_cluster_version = "1.28.6"

## CNI Plugin settings
rt_cluster_cni_plugin = {
    type      = "cilium"
    version   = "1.14.3"
}
```

ADOPTING CLOUD NATIVE AND K8S



GITOPS

- **FLUX**

- Natively supports Helm
- Usable without an UI
- "UNIX" Style
- Used for rolling out applications and services



ADOPTING CLOUD NATIVE AND K8S



GITOPS

weavegitops Applications

SYNC with Source without Source bob Clear All Search

<input type="checkbox"/>	NAME	KIND	NAMESPACE	TENANT	SOURCE	VERIFIED	STATUS	MESSAGE
<input type="checkbox"/>	bob-apps	Kustomization	cluster-ygbvagia	-	flux-system	-	Ready	Applied revision: m
<input type="checkbox"/>	bob-apps-rsc	Kustomization	cluster-ygbvagia	-	flux-system	-	Ready	Applied revision: m
<input type="checkbox"/>	bob-base	Kustomization	cluster-ygbvagia	-	flux-system	-	Ready	Applied revision: m
<input type="checkbox"/>	bob-base-rsc	Kustomization	cluster-ygbvagia	-	flux-system	-	Ready	Applied revision: m
<input type="checkbox"/>	bob-crd	Kustomization	cluster-ygbvagia	-	flux-system	-	Ready	Applied revision: m
<input type="checkbox"/>	bob-etcd-backups	Kustomization	cluster-ygbvagia	-	flux-system	-	Ready	Applied revision: m

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ADOPTING CLOUD NATIVE AND K8S



UPDATES

- **APPLICATIONS / HELM CHARTS**

- Pull Requests created by Renovate

A screenshot of a GitHub pull request interface. At the top, it shows a comment from the bot "renovate". Below the header, there's a decorative banner with the text "MENDRenovate". The main content area starts with the heading "This PR contains the following updates:" followed by a table showing one update. At the bottom, there's a section titled "Release Notes" with a single entry.

Package	Update	Change
kubermatic-cert-manager	minor	v2.24.2 -> v2.25.0

Release Notes

► [kubermatic/kubermatic \(kubermatic-cert-manager\)](#)



ADOPTING CLOUD NATIVE AND K8S



MONITORING

- **GRAFANA AGENT**

- Prometheus for metrics (push model)
- Loki for Logs
- Grafana for visualization

- **ON CALL WITH OPSGENIE**

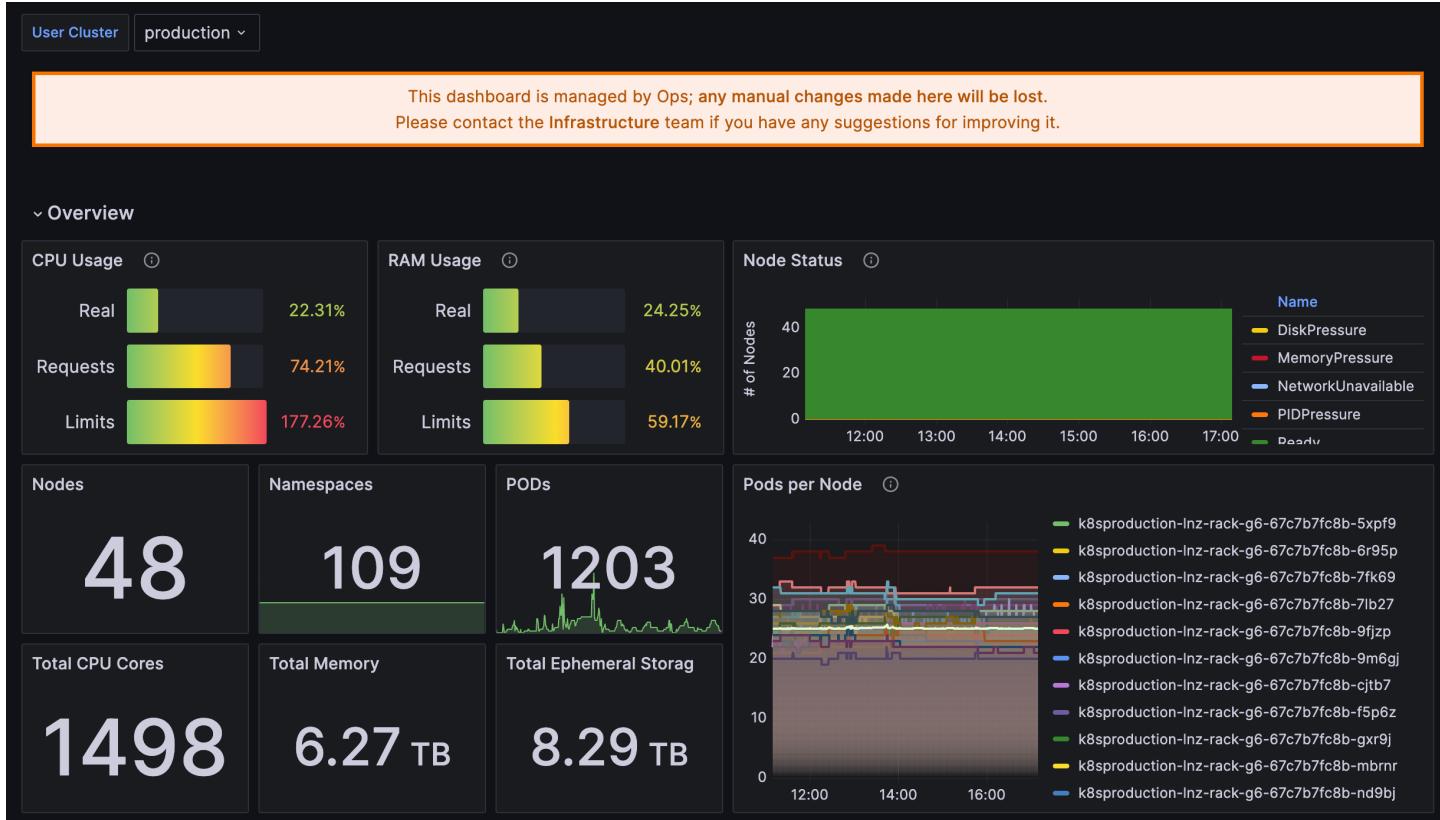
- **NOTIFICATIONS VIA SLACK**



ADOPTING CLOUD NATIVE AND K8S



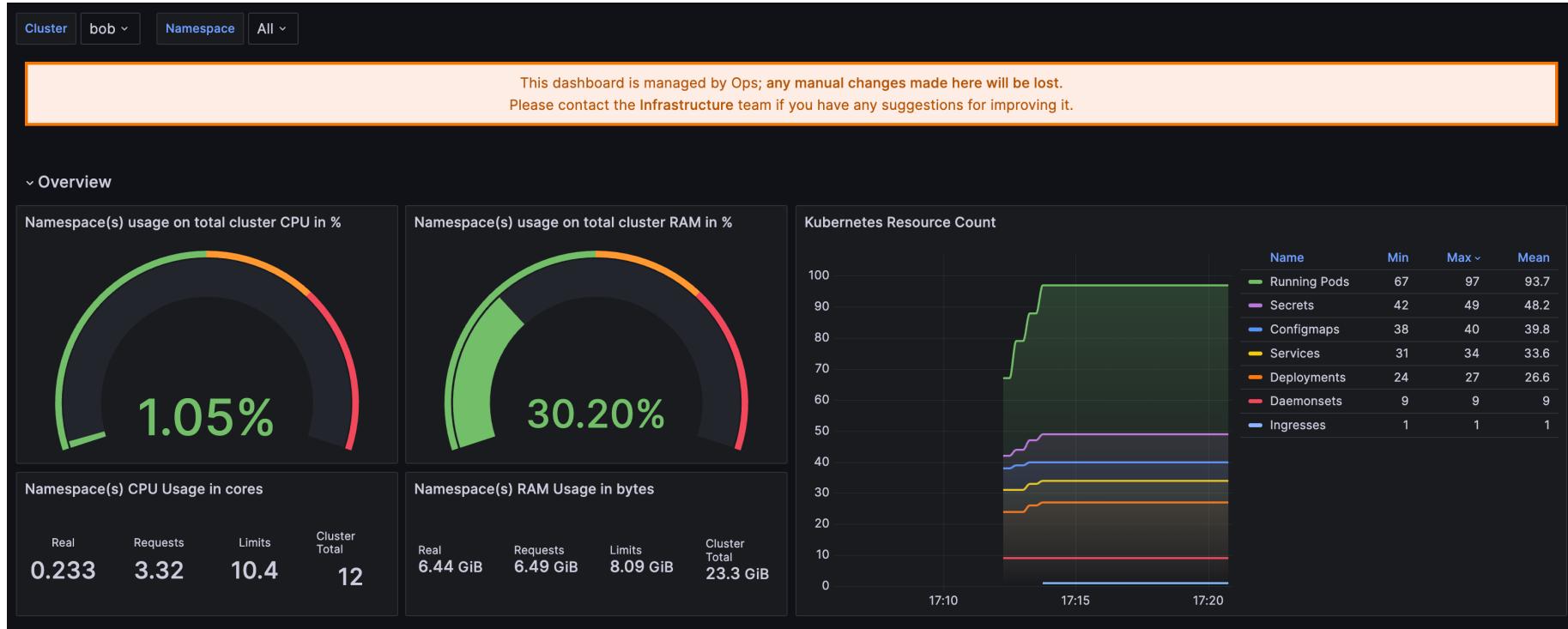
MONITORING



ADOPTING CLOUD NATIVE AND K8S



MONITORING



ADOPTING CLOUD NATIVE AND K8S



MONITORING

 **Opsgenie EU APP** 3:29 PM

#7460: [Prometheus]: alice - Certificate opencost-tls on namespace opencost expires
The SSL certificate opencost-tls on namespace opencost of cluster alice expires in 21 days!

Priority	Routed Teams
P2	k8s

ADOPTING CLOUD NATIVE AND K8S



MONITORING

Loki Test

Outline ▾ Loki Test ▾

Split Add to dashboard Last 1 hour Run query Live

A (Loki Test)

Kick start your query Label browser Explain query

{namespace="random-number-generator",user_cluster="bob"}

Options Type: Range Line limit: 1000 This query will process approximately 1.0 KiB.

Builder Code

+ Add query Query history Query inspector

Logs volume

10:00 10:05 10:10 10:15 10:20 10:25 10:30 10:35 10:40 10:45 10:50 10:55 Loki Test

logs

Logs

Time Unique labels Wrap lines Prettify JSON Deduplication None Exact Numbers Signature Display results Newest first Oldest first

Common labels: eventhandler ygbvagia eventhandler eventhandler integrations/kubernetes/eventha... random-number-generator bob Line limit: 1000 (12 returned) Total bytes processed: 27.9 kB

Download

> 2024-03-22 10:55:02.000 name=docker.io kind=ExternalSecret objectAPIVersion=external-secrets.io/v1beta1 objectRV=6575 eventRV=1772637 reportingcontroller=external-secrets sourcecomponent=external-secrets reason=Updated type=Normal count=3882 msg="Updated Secret"

> 2024-03-22 10:50:02.000 name=docker.io kind=ExternalSecret objectAPIVersion=external-secrets.io/v1beta1 objectRV=6575 eventRV=1770378 reportingcontroller=external-secrets sourcecomponent=external-secrets reason=Updated type=Normal count=3877 msg="Updated Secret"

Start of range

ADOPTING CLOUD NATIVE AND K8S



OTHER COMPONENTS / TOOLS

- **KYVERNO**
- **EXTERNAL SECRETS OPERATOR**
- **CERT MANAGER**
- **EXTERNAL DNS**
- **PIRAEUS**
- ...

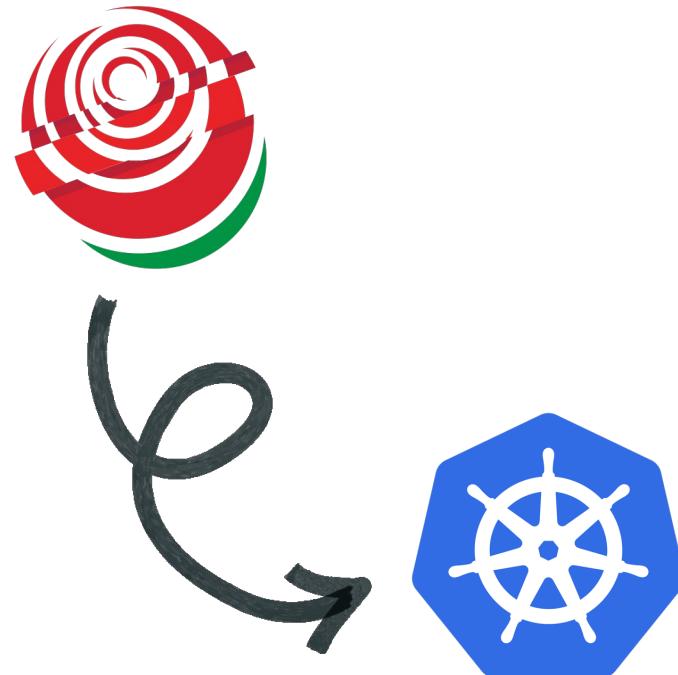


ADOPTING CLOUD NATIVE AND K8S



Migration

- SERVICE BY SERVICE
- NGINX PROXY
- TOOK ABOUT 2 MONTHS
- NO BIG INCIDENTS



CLUSTER CREATION DEMO



THE FUTURE



THE FUTURE



GOING TO THE CLOUD

- **MOVING OUR WORKLOADS TO AWS**
 - Services
 - Databases
 - Storage
 - ...
- **USING THE ADIDAS K8S STACK – GIANT SWARM**
- **LOOKING INTO NEW CNCF TECHNOLOGIES**



SUMMARY



SUMMARY



MOVING ON FROM ROSE



UP TO DATE VANILLA K8S



EASIER SCALING



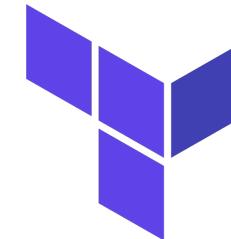
BETTER EXPERIENCE FOR DEVELOPERS



EASIER MAINTENANCE FOR OPERATIONS



FOUNDATIONS TO TRANSFER TO THE CLOUD



SUMMARY



TEAM EFFORT

- **THANKS TO THE TEAM**
 - Andreas
 - Niko
 - Foxy 
 - Shay
 - And others!



LINK

TO OUR GITHUB



**THANK YOU
QUESTIONS?**

