

A Walk Through the Kubernetes UI Landscape

Henning Jacobs, Zalando SE
Joaquim Rocha, Kinvolk











- Kubernetes is complex
- kubectl is powerful, however...
 - Graphical User Interfaces can make things simpler
- So many Kubernetes UIs out there!
 - We have to decide what to look into

Selection Criteria

- Open Source
- Active development (at least one release in last 12 months)
- Standalone use
 - Can be used without a control plane / addons: either just running in-cluster, or as a local/desktop app
- Graphical User Interface

What we look into

- Installation: Hosted  or Desktop  ?
- Cluster support: Mono  or Multiple  ?
- Extensibility: Yes  or No 
- Read-only  / Read-Write 
- Main use-cases, capabilities
 - Other remarks individually
 - Usability

UIs



Kubernetes Dashboard



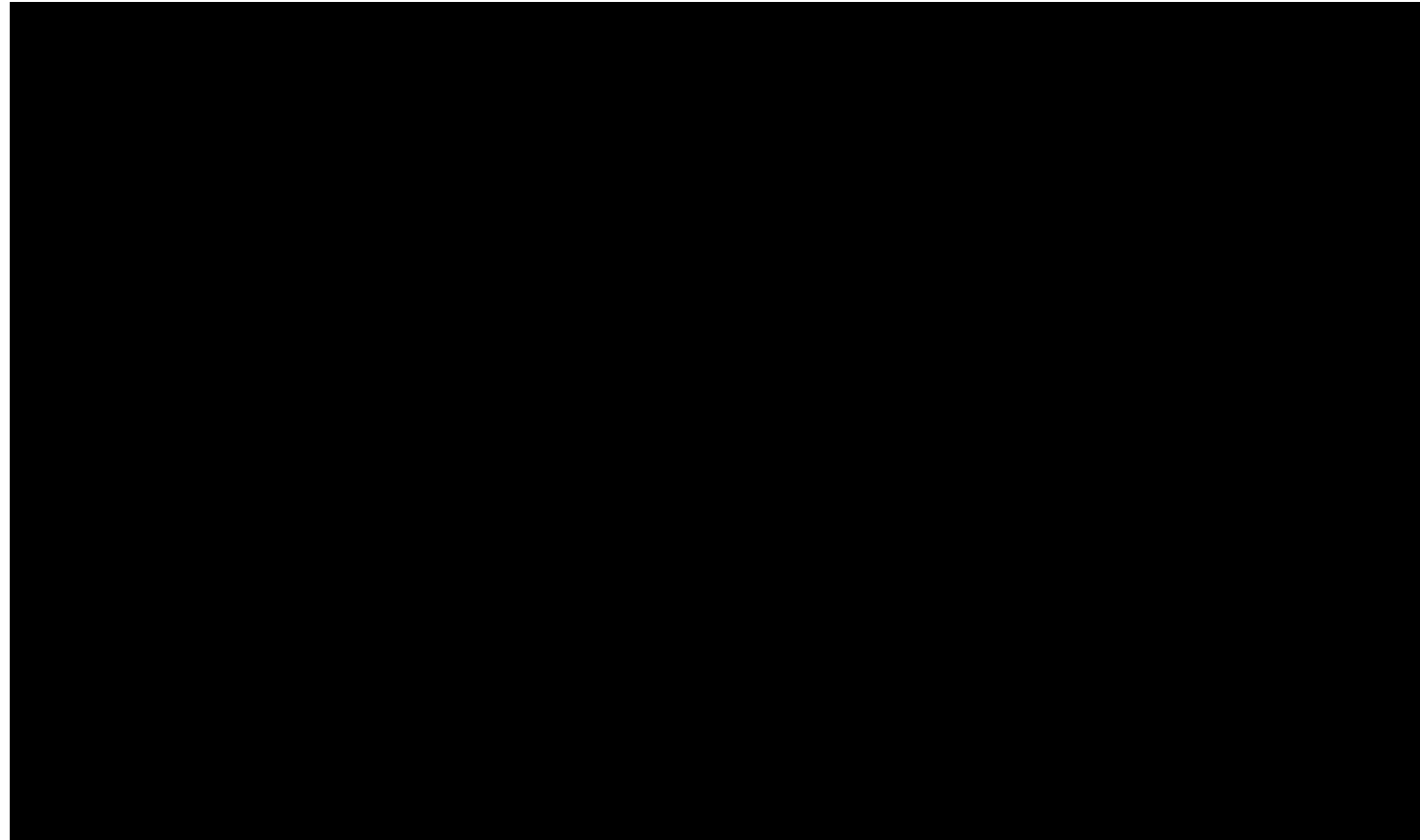
Virtual

North America 2020



The "official" dashboard

- Deployed to cluster
- For application developers
- Authentication with SA token
- Exec, Logs, Scale, Edit
- Single-cluster
- Search
- Limited set of features



K8dash



KubeCon



CloudNativeCon

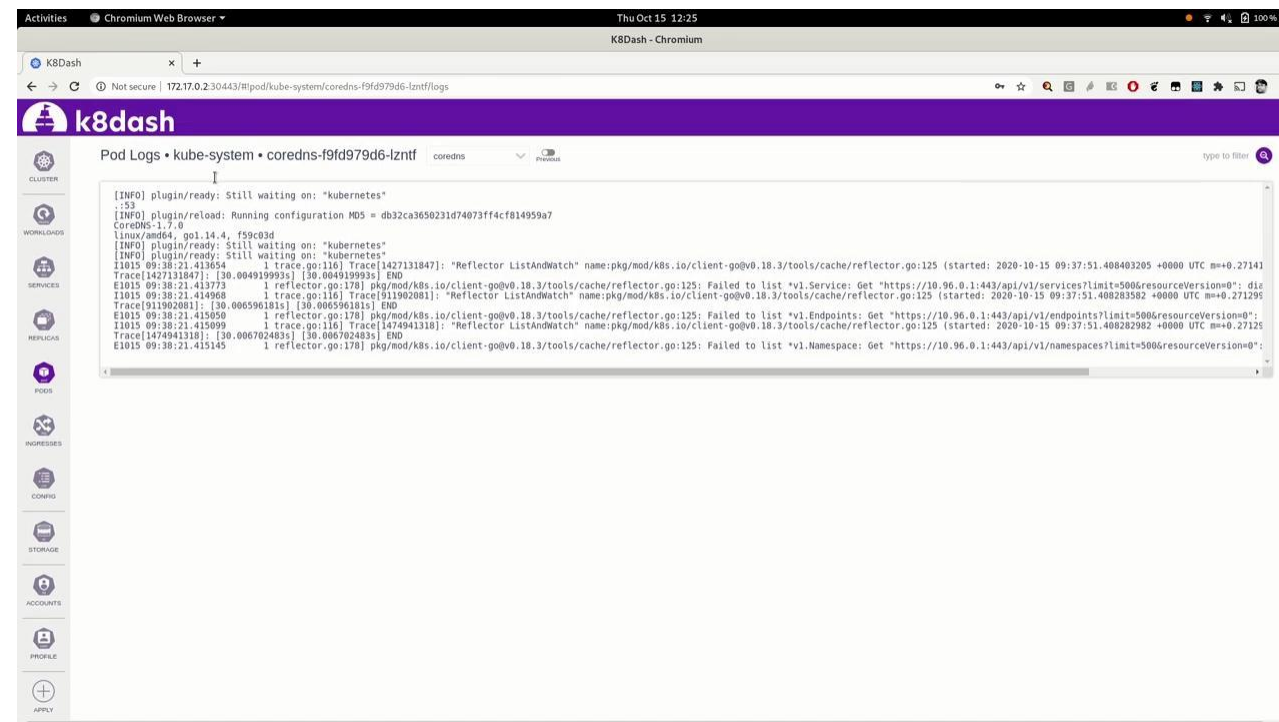
North America 2020

Virtual



Simple alternative to Kubernetes Dashboard

- Feels lightweight / simple
- UI and navigation could be arguably improved
- Editor shows documentation
- Not extensible
- Requires full access to cluster
 - Fails to auth with a view-only token
- No cluster search



Kubevious



KubeCon



CloudNativeCon

North America 2020

Virtual



"Making app config & state safe and easy to understand"

- Analyze your cluster
- Custom rules (JavaScript)
- Custom marker icons
- Time machine (uses DB)
- Single-cluster
- Stripped-down "portable" version



kubevious



"for developers to better understand the complexity of Kubernetes clusters"

- Local only
- Object graph
- Nice flow for port forwarding
- Plugins
- No search
- No cross-cluster features



Lens



KubeCon



CloudNativeCon

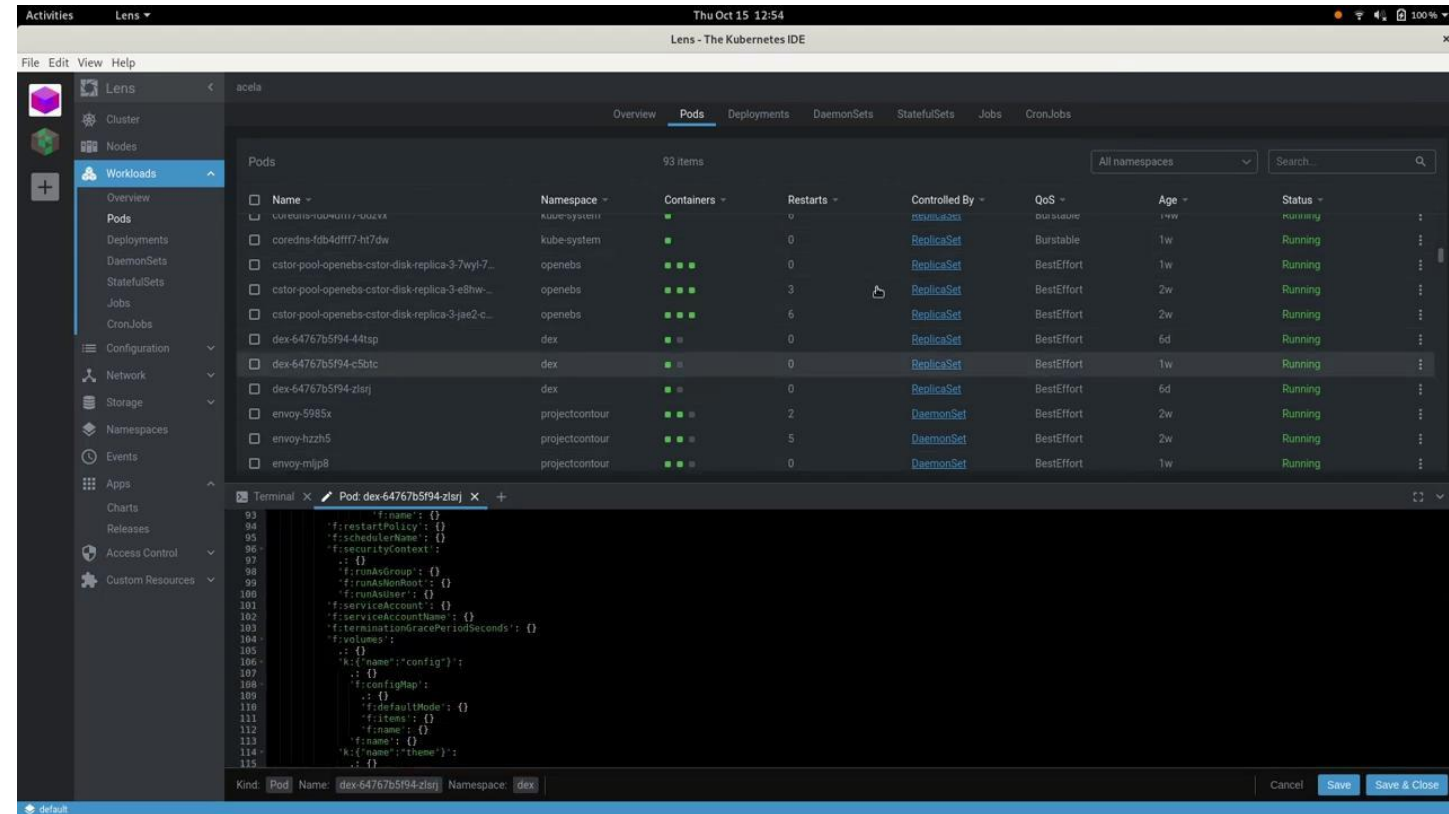
North America 2020

Virtual



"The Kubernetes IDE"

- Easy to install with builds for Linux, Mac, Windows
- Very good UI and UX
- Multi-cluster support
- Helm charts "store"
- Ships *kubectl*
- No cross-cluster features
- Not extensible



Kubenav

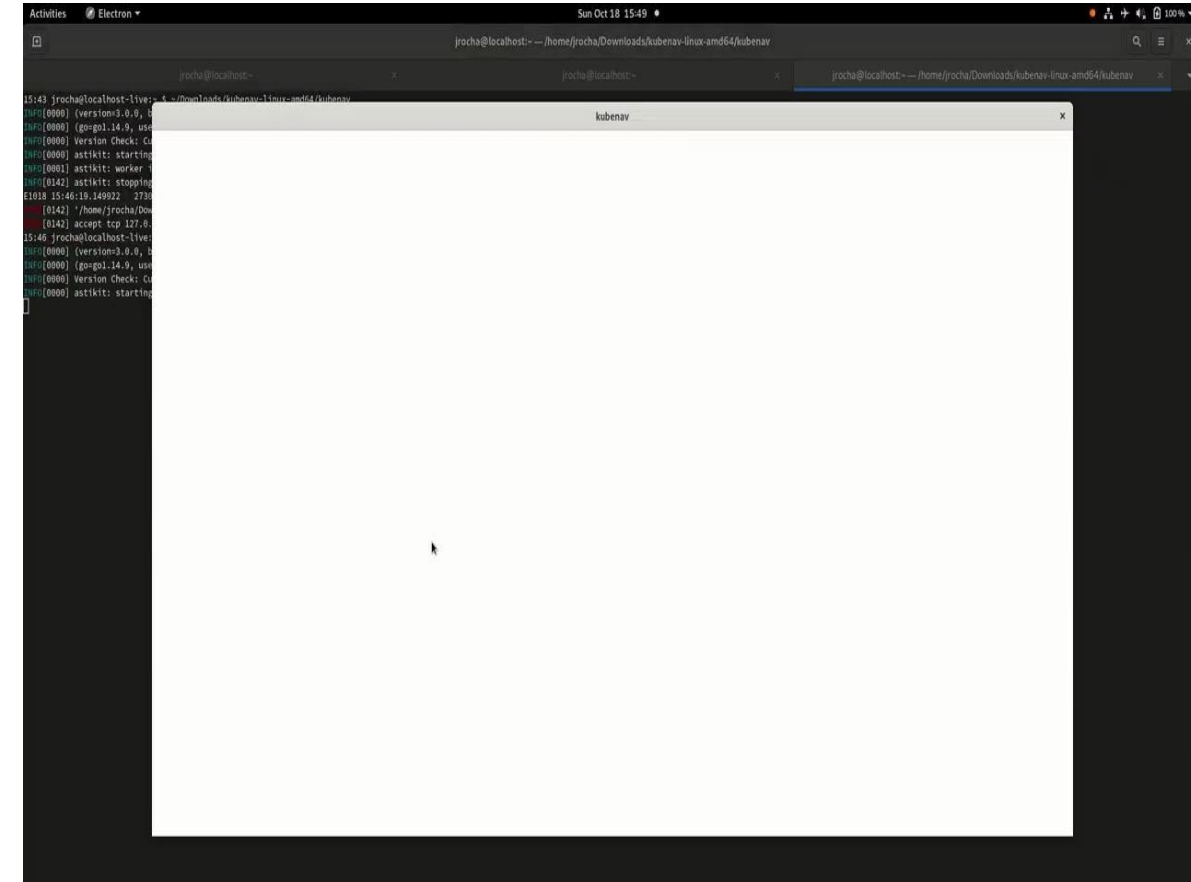


Virtual



“Kubernetes clusters right in your pocket”

- Works hosted, on desktop, and on mobile devices
- Mobile-first, so on the desktop the UI usability is lacking (e.g. lists instead of tables)
- Not clear how to authenticate (used whatever was in the kubeconfig)
- No cross-cluster features



Headlamp



KubeCon



CloudNativeCon

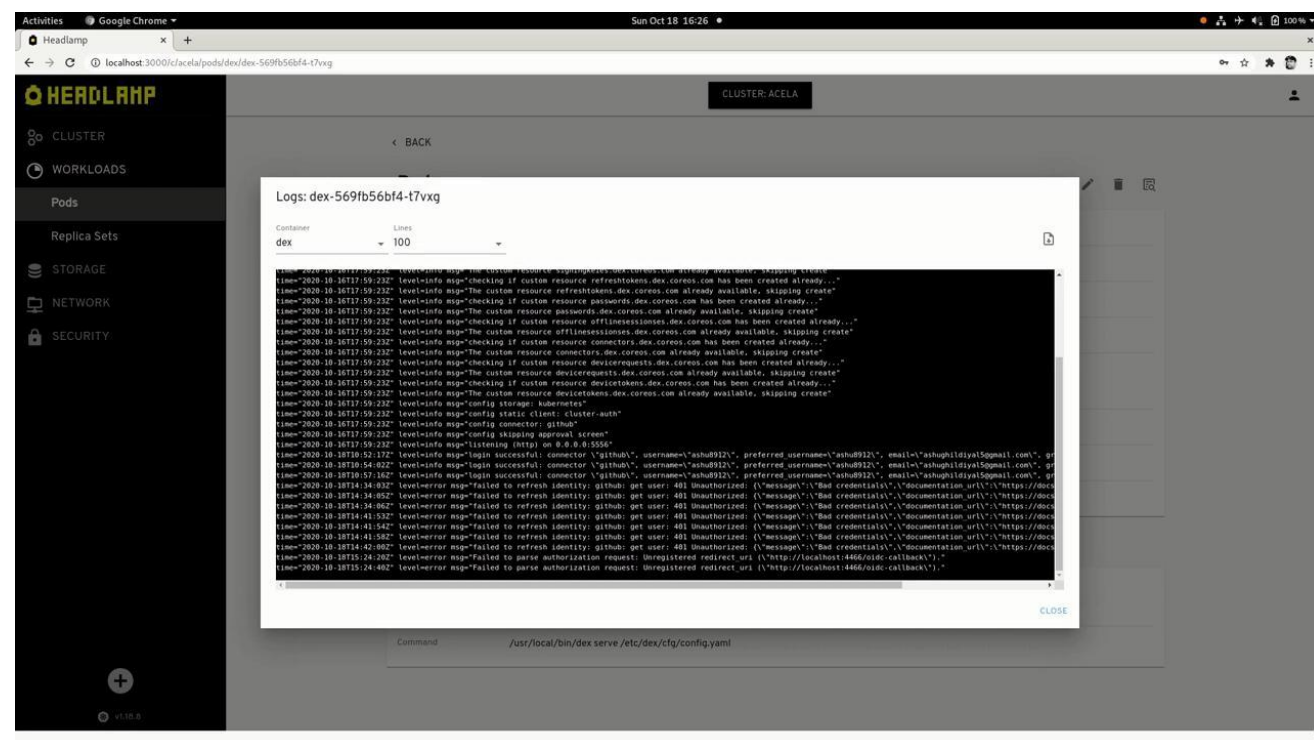
Virtual

North America 2020



An easy-to-use and extensible Kubernetes UI

- Extensible through frontend plugins
- Editor shows documentation
- Actions cancellable within a grace period
- Controls dependent on the user's role
 - e.g. edit button not shown if the user cannot edit a resource
- Keyboard shortcuts
- No cross-cluster search yet (planned)



Kubernetes Web View



KubeCon



CloudNativeCon

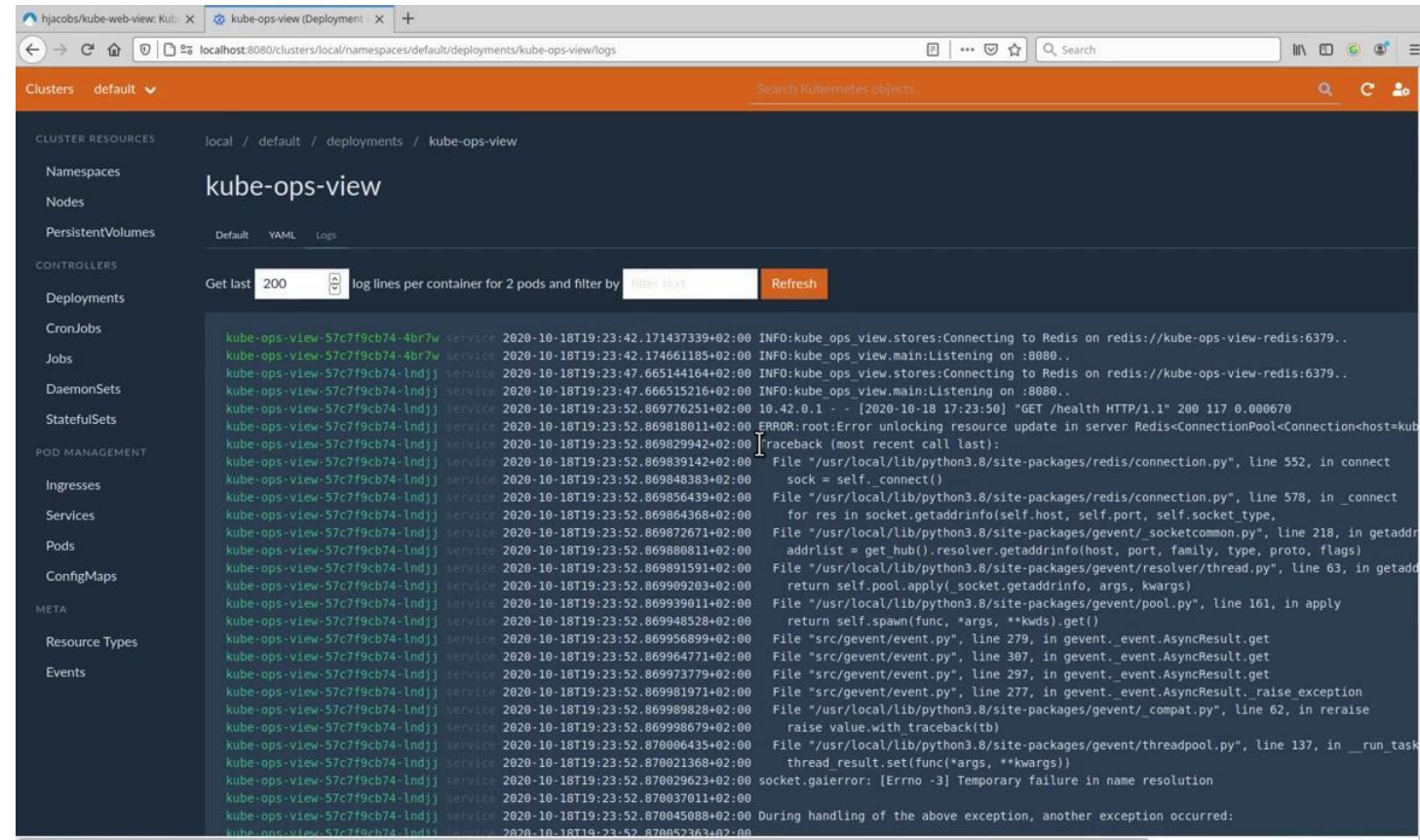
North America 2020

Virtual



"kubectl for the web"

- Support & Incident Response
- Permalinks
- Plain HTML/CSS
- Responsive
- Multi-cluster & search
- Advanced queries/filters
- HTML/style is customizable, but no plugins/extensions



Honorable Mention: K9s



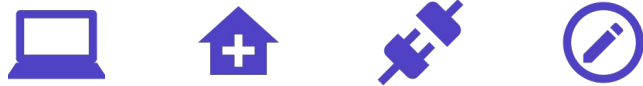
KubeCon



CloudNativeCon

North America 2020

Virtual



“Manage Your Clusters In Style”

- Interactive CLI
- Highly customizable
- Very good as a quick/simple way to navigate and operate a cluster
- Has a great logo



```
Activities  Terminal
jrocha@localhost: ~ — .k9s - n kube-system

Context: minikube
Cluster: minikube
User: minikube
K9s Rev: 0.22.1 [392015]
K8s Rev: v1.19.2
CPU: 0%
MEM: 0%

[<-] all  [<-] Ctrl+Q Clear  [<-] Toggle Timestamp
[<-] 1m  [<-] C< Copy  [<-] Toggle Wrap
[<-] 5m  [<-] M< Mark
[<-] 15m  [<-] Ctrl+S Save
[<-] 30m  [<-] Toggle AutoScroll
[<-] 1h  [<-] C< Toggle Fullscreen

Logs(kube-system/metrics-server-68b849498d-vk5tr: metrics-server)[in]
Autoscroll:On  FullScreen:Off  Timestamps:Off  Wrap:Off

E1015 13:35:32.317620 1 reststorage.go:135] unable to fetch node metrics for node "minikube": no metrics known for node
E1015 13:35:32.321908 1 reststorage.go:135] unable to fetch node metrics for node "minikube": no metrics known for node
E1015 13:35:32.764209 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/metrics-server-68b849498d-vk5tr: no metrics known for pod
E1015 13:35:32.764233 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/kube-proxy-zknbv: no metrics known for pod
E1015 13:35:32.764246 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/etcd-minikube: no metrics known for pod
E1015 13:35:32.764246 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/kube-scheduler-minikube: no metrics known for pod
E1015 13:35:32.764252 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/k8dash-87fdbb96-ktg9w: no metrics known for pod
E1015 13:35:32.764258 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/storage-provisioner: no metrics known for pod
E1015 13:35:32.764264 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/coredns-f9fd979d6-lzntf: no metrics known for pod
E1015 13:35:32.764269 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/kube-apiserver-minikube: no metrics known for pod
E1015 13:35:32.764275 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/kube-controller-manager-minikube: no metrics known for pod
E1015 13:35:40.498765 1 manager.go:111] unable to fully collect metrics: unable to fully scrape metrics from source kubelet_summary:minikube: unable to fetch metrics from Kubelet minikube (minikube): Get https://minikube:10250/v1.19.2/metrics: dial tcp 192.168.99.1:10250: connect: connection refused
E1015 13:36:00.825600 1 reststorage.go:135] unable to fetch node metrics for node "minikube": no metrics known for node
E1015 13:36:00.827722 1 reststorage.go:135] unable to fetch node metrics for node "minikube": no metrics known for node
E1015 13:36:00.840388 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/metrics-server-68b849498d-vk5tr: no metrics known for pod
E1015 13:36:00.840400 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/kube-proxy-zknbv: no metrics known for pod
E1015 13:36:00.840403 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/etcd-minikube: no metrics known for pod
E1015 13:36:00.840406 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/kube-scheduler-minikube: no metrics known for pod
E1015 13:36:00.840409 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/storage-provisioner: no metrics known for pod
E1015 13:36:00.840412 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/coredns-f9fd979d6-lzntf: no metrics known for pod
E1015 13:36:00.840416 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/kube-apiserver-minikube: no metrics known for pod
E1015 13:36:00.840421 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/kube-controller-manager-minikube: no metrics known for pod
E1015 13:36:00.840425 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/k8dash-87fdbb96-ktg9w: no metrics known for pod
E1015 13:36:14.314232 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/etcd-minikube: no metrics known for pod
E1015 13:36:14.314281 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/kube-scheduler-minikube: no metrics known for pod
E1015 13:36:14.314294 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/metrics-server-68b849498d-vk5tr: no metrics known for pod
E1015 13:36:14.314305 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/kube-proxy-zknbv: no metrics known for pod
E1015 13:36:14.314316 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/kube-apiserver-minikube: no metrics known for pod
E1015 13:36:14.314327 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/kube-controller-manager-minikube: no metrics known for pod
E1015 13:36:14.314338 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/k8dash-87fdbb96-ktg9w: no metrics known for pod
E1015 13:36:14.314349 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/storage-provisioner: no metrics known for pod
E1015 13:36:14.314360 1 reststorage.go:160] unable to fetch pod metrics for pod kube-system/coredns-f9fd979d6-lzntf: no metrics known for pod

cdeployments  cPods  cLogs
```

Other UIs



Not-standalone UIs



KubeCon

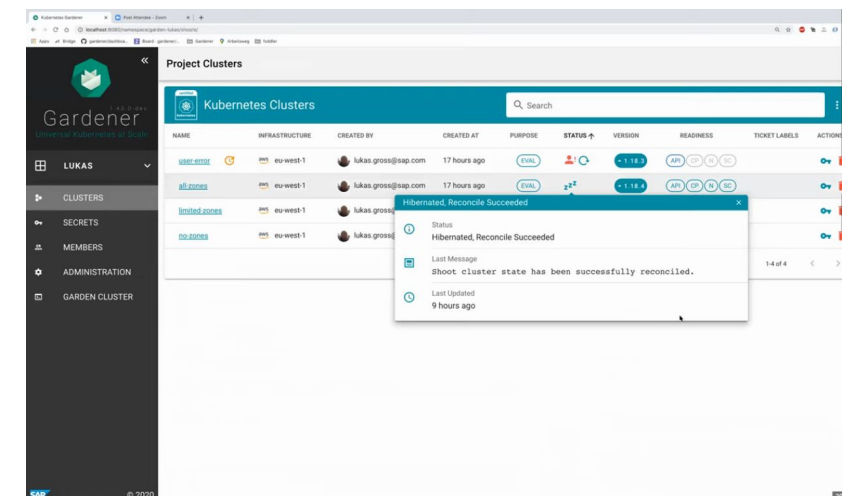
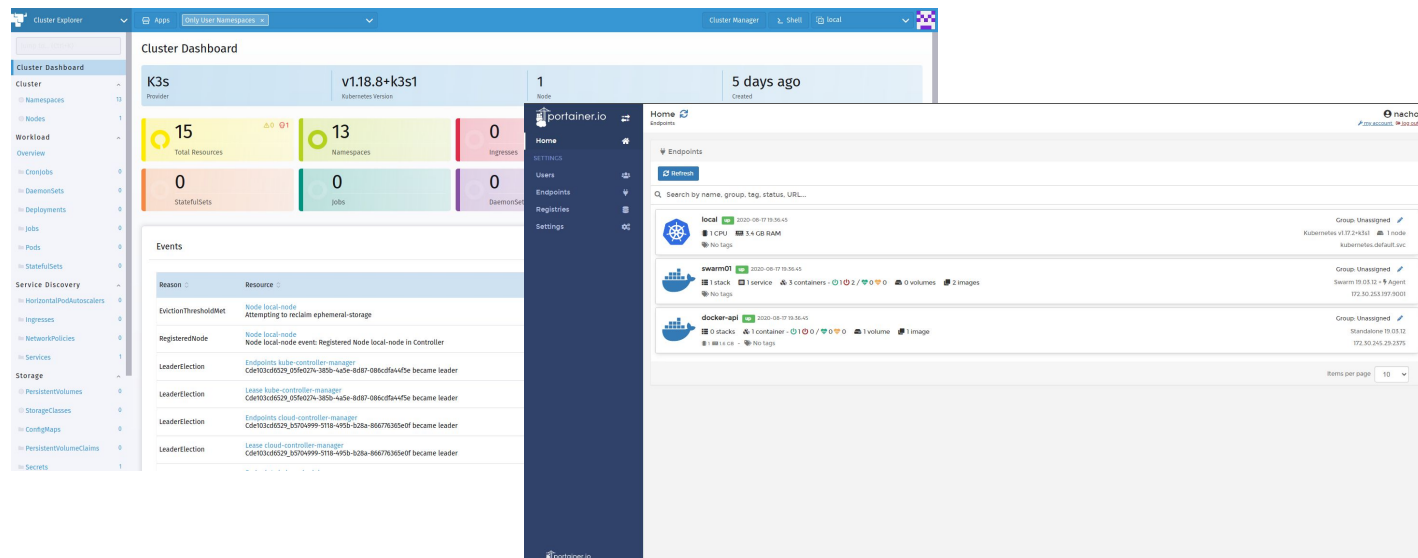
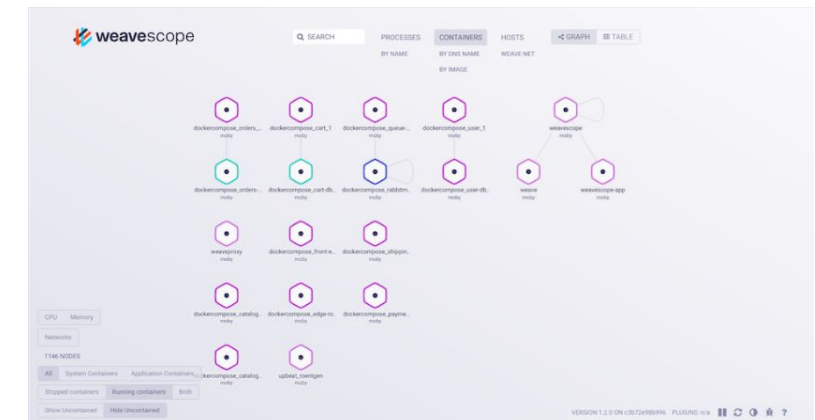


CloudNativeCon

North America 2020

Virtual

- **Rancher Dashboard UI** — "Cluster Explorer", not available standalone (?)
- **Gardener UI** — just for managing clusters
- **Linkerd UI** — requires Linkerd control plane
- **Kiali/Istio** — requires Istio service mesh
- **Weave Scope** — requires the probe app
- **Portainer** — requires data persistency



Others left out



KubeCon

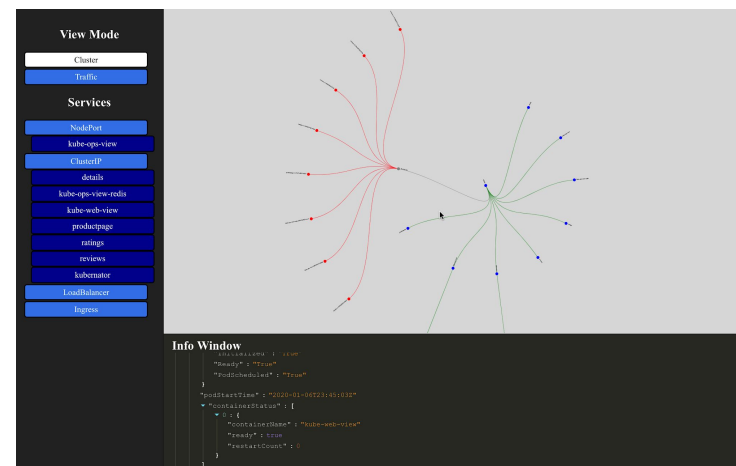
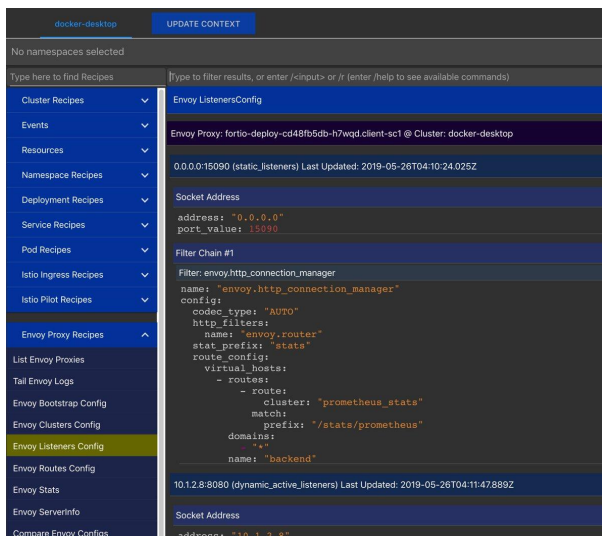
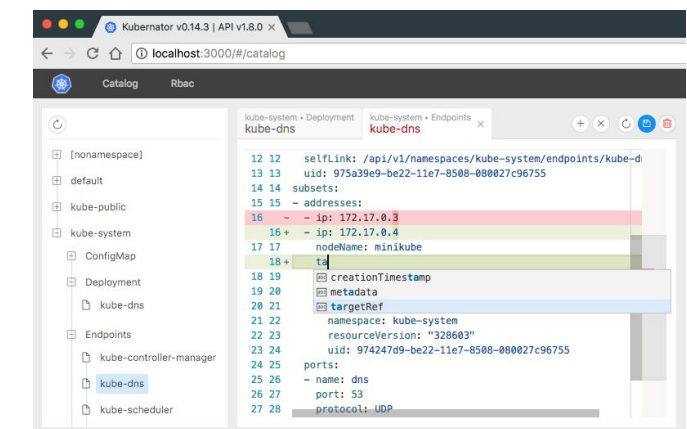
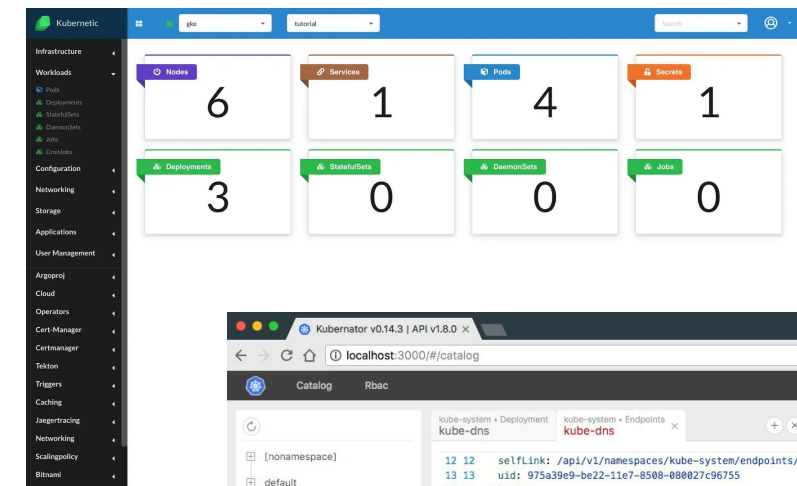
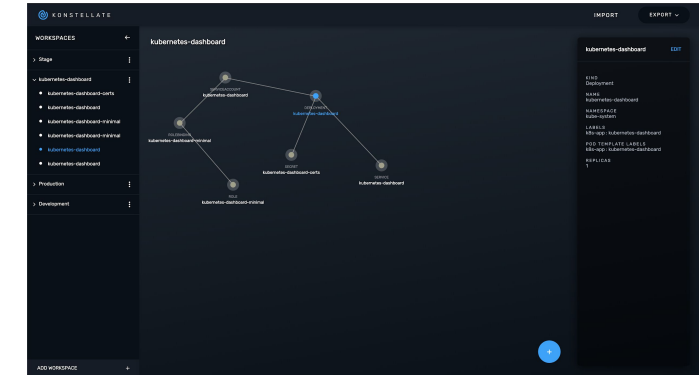


CloudNativeCon

North America 2020

Virtual

- **Konstellate** — stale, last commit July 2019
- **Kubeman** — stale, last commit August 2019
- **Kubricks** — stale, last commit February 2019
- **Kubernator** — stale, "latest" tag one year old
- **Kubernetes** — proprietary



Wrap Up



Quick Comparison



Virtual

North America 2020

Project	Multi-cluster	Local	Hosted	Read-Write	Extensible
Headlamp	✓	✓	✓	✓	✓
K8dash			✓	✓	
Kubonav	✓	✓	✓	✓	
Kubernetes Dashboard		✓	✓	✓	✓
Kubernetes Web View	✓		✓		*
Kubevious		✓	✓		✓
Lens	✓	✓		✓	
Octant	✓	✓		✓	✓



Anlage / Clipboard



North America 2020

Virtual

