

Kuberma~~c~~tic

Kuberma~~c~~tic Kubernetes Platform

Automated Kubernetes Operations

```
informer coreInformers PodInformer
record NewBroadcaster()
startLogging(klog.Infof)
startRecordingToSink(&v1core.Event{})

nil && kubeClient.CoreV1().RESTClient()

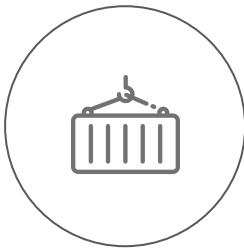
oller{
    : kubeClient,
    controller: controller.RealPodController,
    client: kubeClient,
    recorder: eventBroadcaster.NewRecorder(
        controller: controller.NewControllerExpireAfterSeconds(1),
        workqueue: workqueue.NewNamedRateLimiter(
            controller: controller.NewControllerExpireAfterSeconds(1),
            eventBroadcaster: eventBroadcaster.NewRecorder(
                informer: informer.Informer(),
                addFunc: func(obj interface{}) {
                    jm.enqueueController(obj, true)
                },
                updateFunc: jm.updateJob,
                deleteFunc: func(obj interface{}) {
                    jm.enqueueController(obj, true)
                },
            ),
        ),
    ),
}
```

Kubermatic

Company Overview

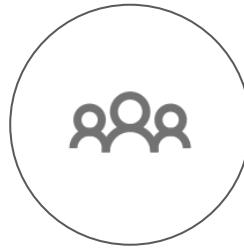


Kubernetes Operations on Autopilot



Our Expertise

Kubermatic is a leading expert for container and cloud native technologies.



Our Team

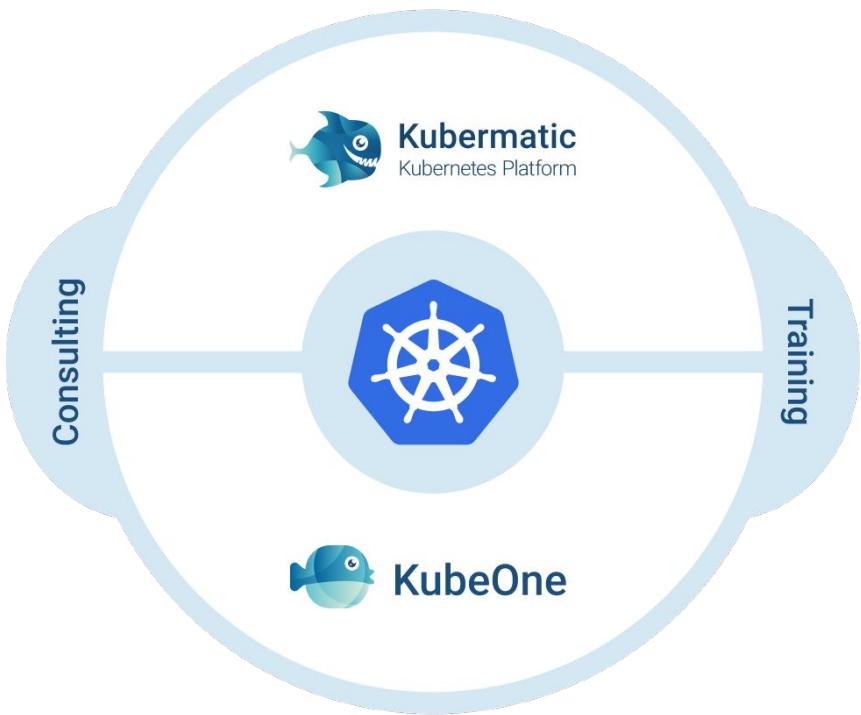
We are a team of 50+ employees across Europe and the US.



Locations

Founded in 2016, our headquarters are located in Hamburg, Germany.

Our Portfolio



Kubermatic Kubernetes Platform

Kubermatic Kubernetes Platform empowers you to easily deploy, manage and run multiple Kubernetes clusters in the cloud, in private data centers or hybrid scenarios.



Professional Services

With our tailor-made consulting services, we are a reliable partner at every step in building, implementing, running and automating your containerized infrastructure.



Training

Our experienced instructors will make sure that your team has the knowledge and skills needed to successfully adopt container and cloud native technologies.

We Are the Leading European Kubernetes Experts

- Creator of **KubeOne & Kuberma^{tic} Kubernetes Platform**, widely deployed in EU
- We are the top Kubernetes employer in Europe
- We are **#5 top committer** to the [Kubernetes Projects](#) in the past 12 months
- We employ the **#1 and #2 top contributors** to [Kubernetes Dashboard](#) for the past 2.5 years



We Are the Leading European Kubernetes Experts

- We host the largest Container Conference, Container Days with 1000+ attendees, after KubeCon
- Co-hosting Enterprise Cloud Native Summit
- Kubernetes Meetups in Hamburg, Munich, Stuttgart, Amsterdam, Copenhagen & Online Meetup

CONTAINER
days



The Most Demanding Enterprises Choose Kubermatic



Lufthansa



BOSCH

Allianz The Allianz logo icon is three vertical bars of increasing height inside a circle.

otto group



arvato
BERTELSMANN

SIEMENS
Ingenuity for life

VOLKSWAGEN
AKTIENGESELLSCHAFT

INNOVO.
CLOUD

DAIMLER

REWE

The SysEleven logo icon is a green diamond pattern followed by the word "SysEleven".

1&1

T-Systems



SPIEGEL
GRUPPE

Kubernetes

Transforming from Kubernetes to Automated Multi-cloud Ops



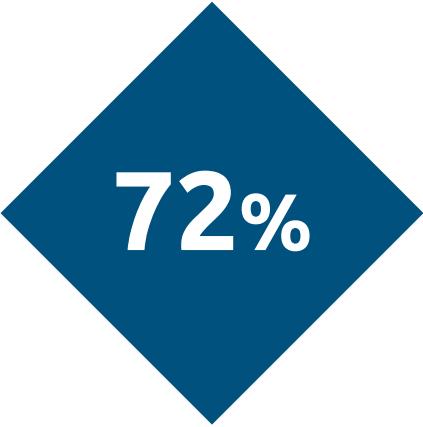
Simply Adopting Multi-cloud and
Kubernetes is Just Not Enough

The Paradox



91%

of companies use
hybrid and multi-cloud



72%

cite complexity as
major challenge



36%

use orchestration



10%

use automated
orchestration

Levels of Autonomous Driving -> Ops Level of Automation

0	1	2	3	4	5
No Automation	Operation Assistance	Partial Operation Automation	Conditional Operation Automation	High Operation Automation	Full Operation Automation
Manual control. The human performs all tasks.	The system features a single automated task e.g. monitoring & alerts.	The system can automatically perform tasks. Human still monitors all tasks and can take control at any time.	The system can perform most tasks automatically, but human override is still required.	The system performs all tasks under specific conditions but human override is still an option.	The system performs all tasks under all conditions. Zero human attention is required. Human override is still an option.

The human monitors the system

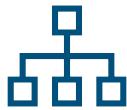
The automated system monitors the environment

The New World Is Here

	Old World	New World
Infrastructure	Vendor lock-in	➡ Continuous freedom of choice
Dev Experience	Waiting for Ops	➡ Self-service platform
Operations	Resource-intensive	➡ Automated
Resilience	Costly downtimes	➡ Highly available, self-healing infrastructure
Cloud costs	Cloud-provider dependant	➡ Choose of the price-performance

Kubermatic Kubernetes Platform

A Unified Solution for Automated Cloud Native Operations
With One Enterprise-grade Self-service Platform



Any Infrastructure



Automated Ops



Density & Resilience



Security



App Delivery &
Developer Experience

Consistency from Cloud to Core to Edge

✓ Platform

✓ Operations

✓ Policy & Security

✓ Management

✓ User Experience

The screenshot displays the Kubermatic Kubernetes Platform's web interface. At the top, there are navigation links for 'Cluster', 'SSH keys', 'Members', and 'Service Accounts'. Below this is a 'Projects' section with a table showing four projects: 'Avengers', 'Stark Industries', 'Batcave', and 'Widowwebsite'. Each project has an ID, the number of clusters it contains, its role (Owner, Viewer, or Editor), and its owners. A 'Connect' button is also present. In the center, there is a large logo for 'Kubermatic Kubernetes Platform' featuring a stylized blue fish. To the right, there is a sidebar for 'SSHKey name' and a table for 'Kubelet Version' and 'Created' times.

Name	ID	Clusters	Role	Owners
Avengers	lgvojnjjdd	1	Owner	Tony Stark, Bruce Banner, Natasha R... +4
Stark Industries	oljjelanks	2	Owner	Tony Stark
Batcave	uashdakdj	1	Viewer	Bruce Wayne
Widowwebsite	asdjkasdia	2	Editor	Natasha Romanov

Kubelet Version	Created
v1.13.5	a few seconds ago
v1.13.5	1 day ago

“

Before Kubermatic Kubernetes Platform our system would scale, but our staff wouldn't. We needed a new engineer with every 10th customer, resulting in a bottleneck.

Kubermatic Kubernetes Platform helped us get rid of unnecessary work, freeing our engineers to focus on improving our products.

Simon Pearce

SysEleven



Kubermatic Kubernetes Platform Architecture



Kubermatic
Kubernetes Platform

App-Operator

Service Catalog

Identity Management

Monitoring & Logging

SRE Workflow

Billing & Accounting

CaaS-Operator



kubernetes



OPENSIFT

Multi- & Hybrid-Cloud Control Plane (Meta Orchestrator)

IaaS-Operator



Google Cloud

Azure

openstack.

DigitalOcean

HETZNER
ONLINE

VMware
vSphere

packet

kubeAdm

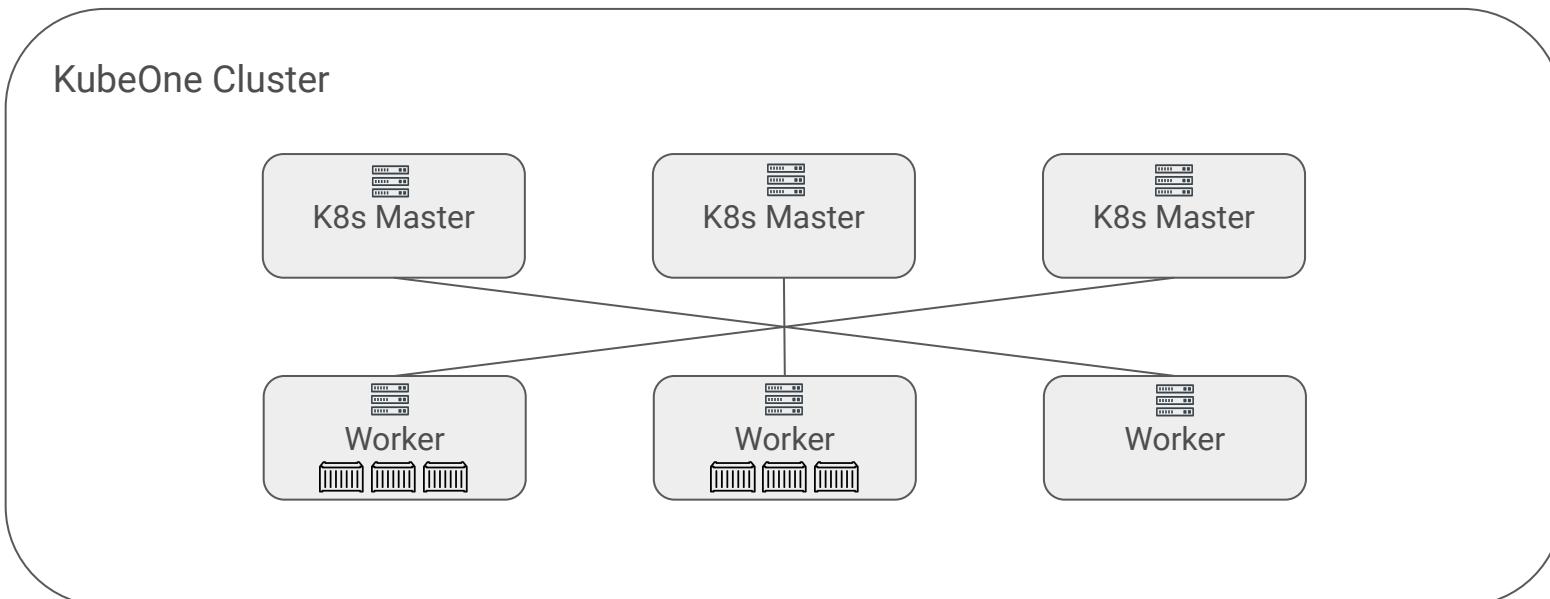
Demos

Basic Architecture

(small scale level, regional setup)

KubeOne Cluster

KubeOne Cluster - Vanilla Kubernetes



KubeOne Cluster



Kuberma~~c~~^{tic}

KubeOne Cluster



Kuberma^{tic}



API

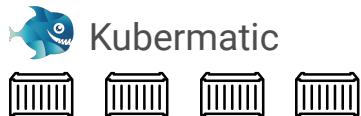


Controller



UI

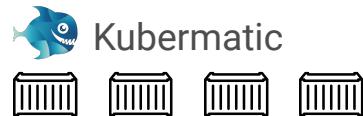
KubeOne Cluster



User k8s Master



KubeOne Cluster

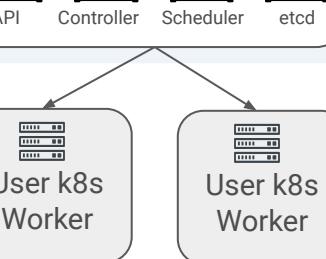


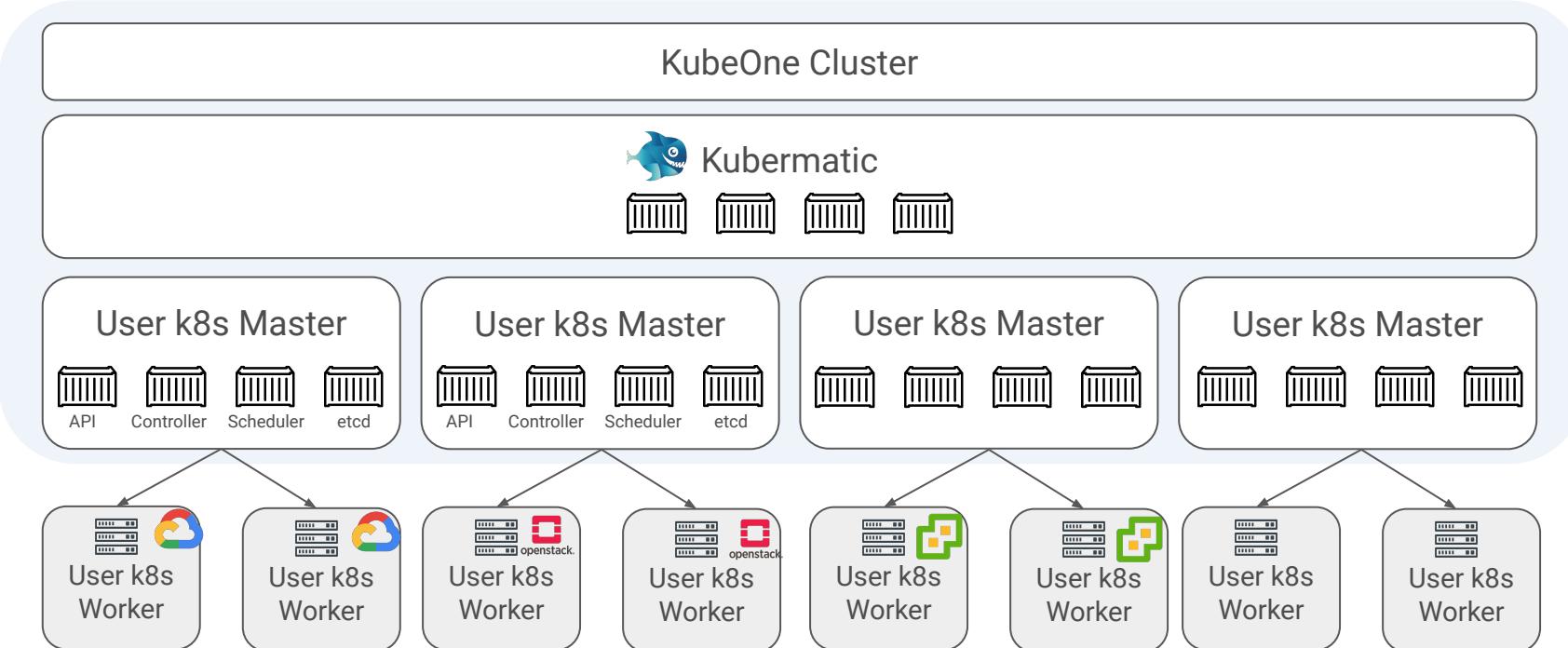
User k8s Master



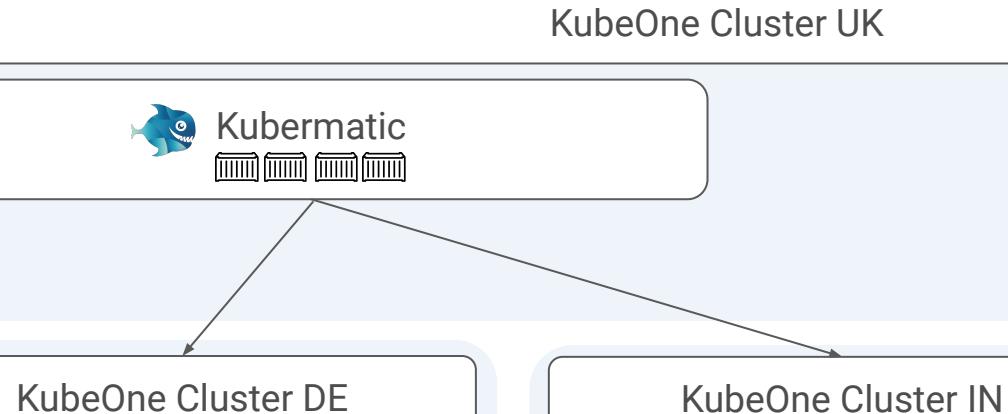
User k8s
Worker

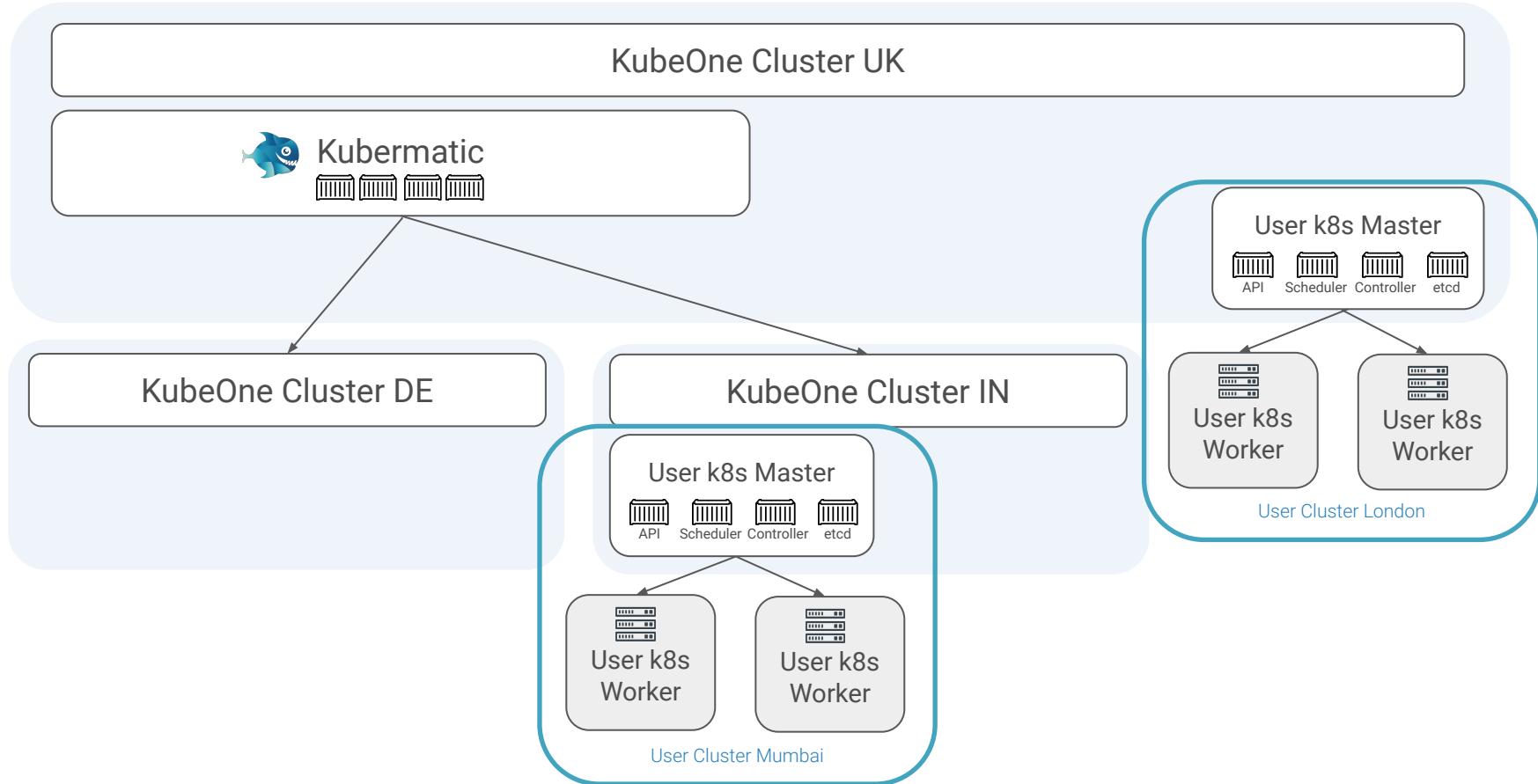
User k8s
Worker



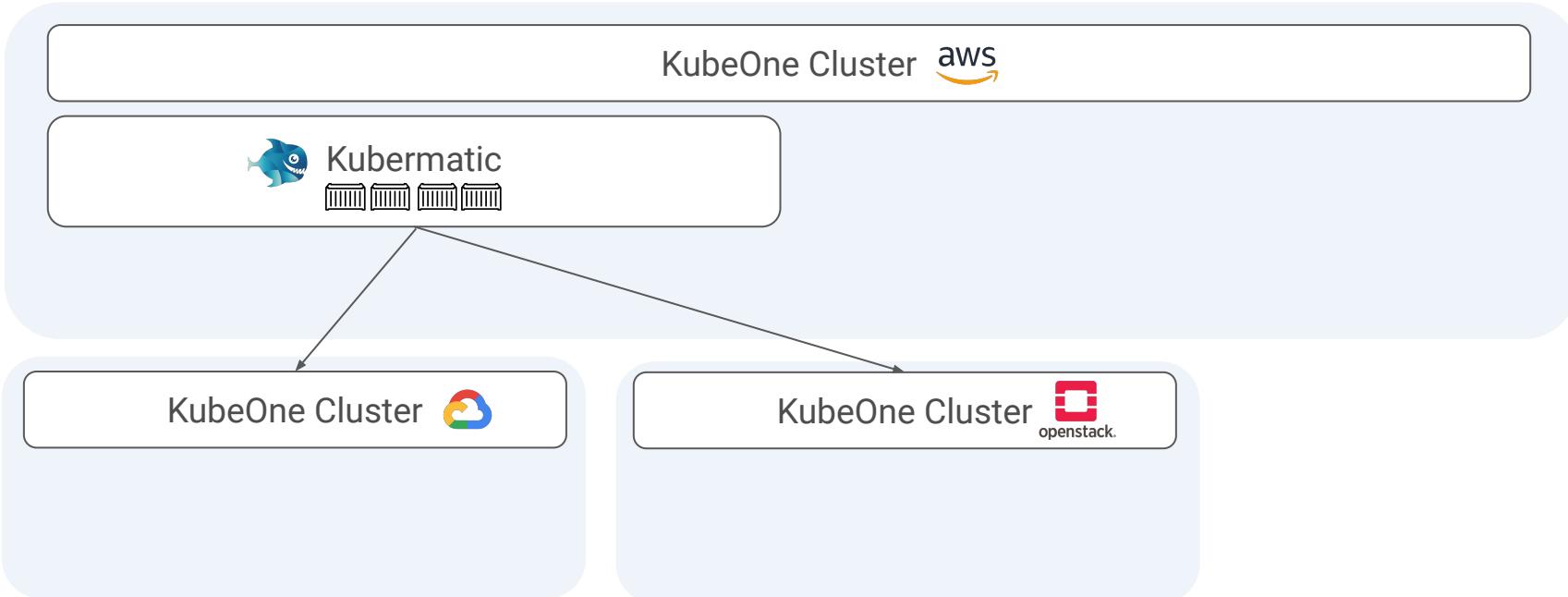


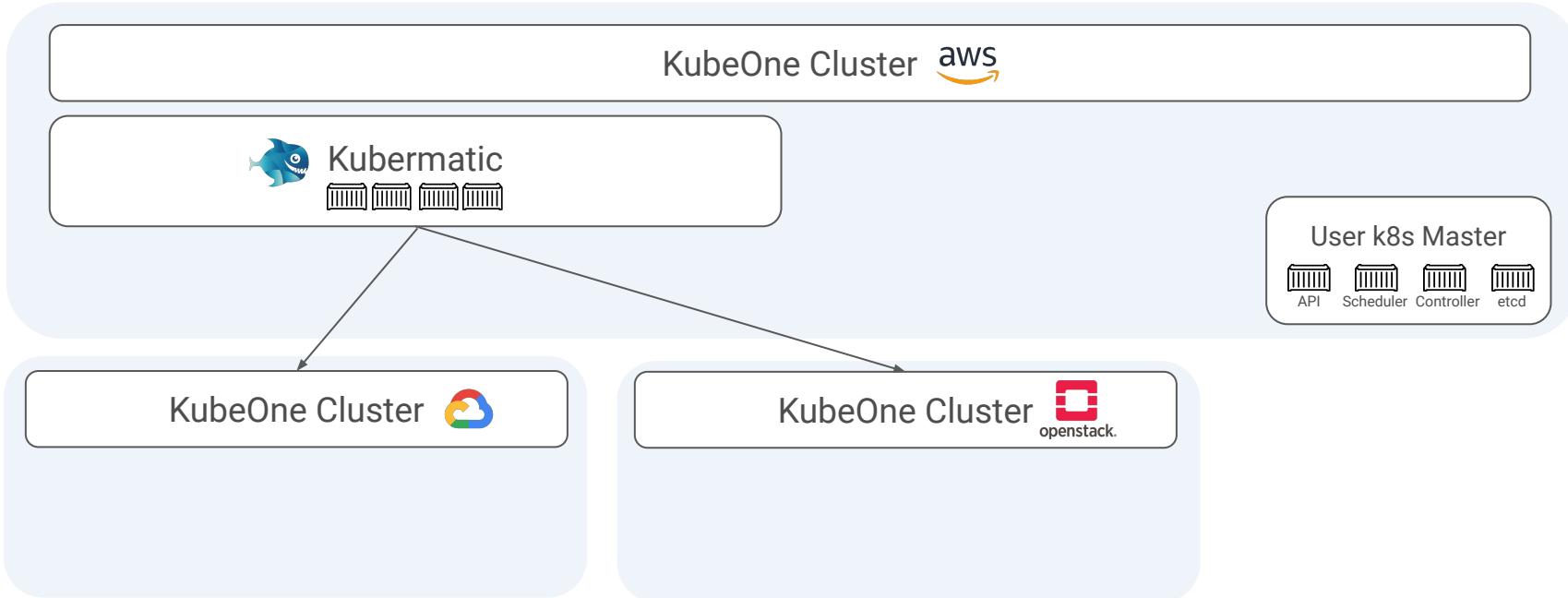
Multiple Local Markets

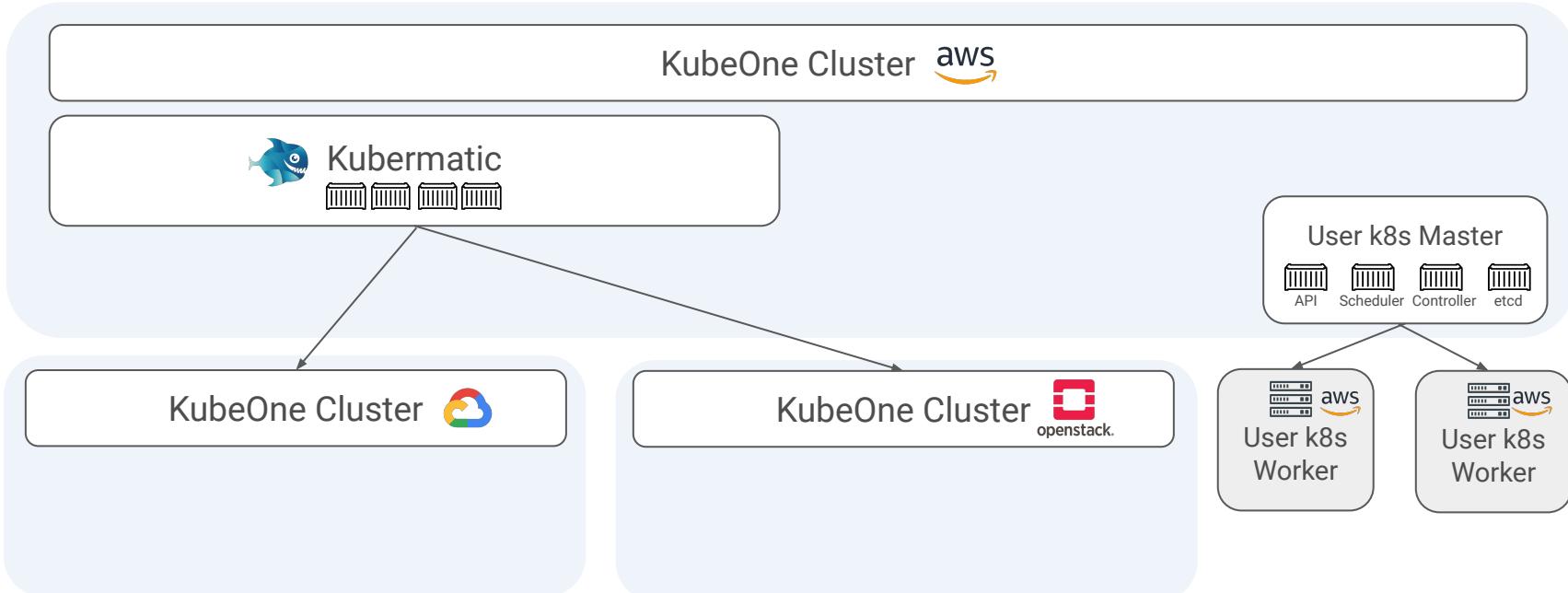


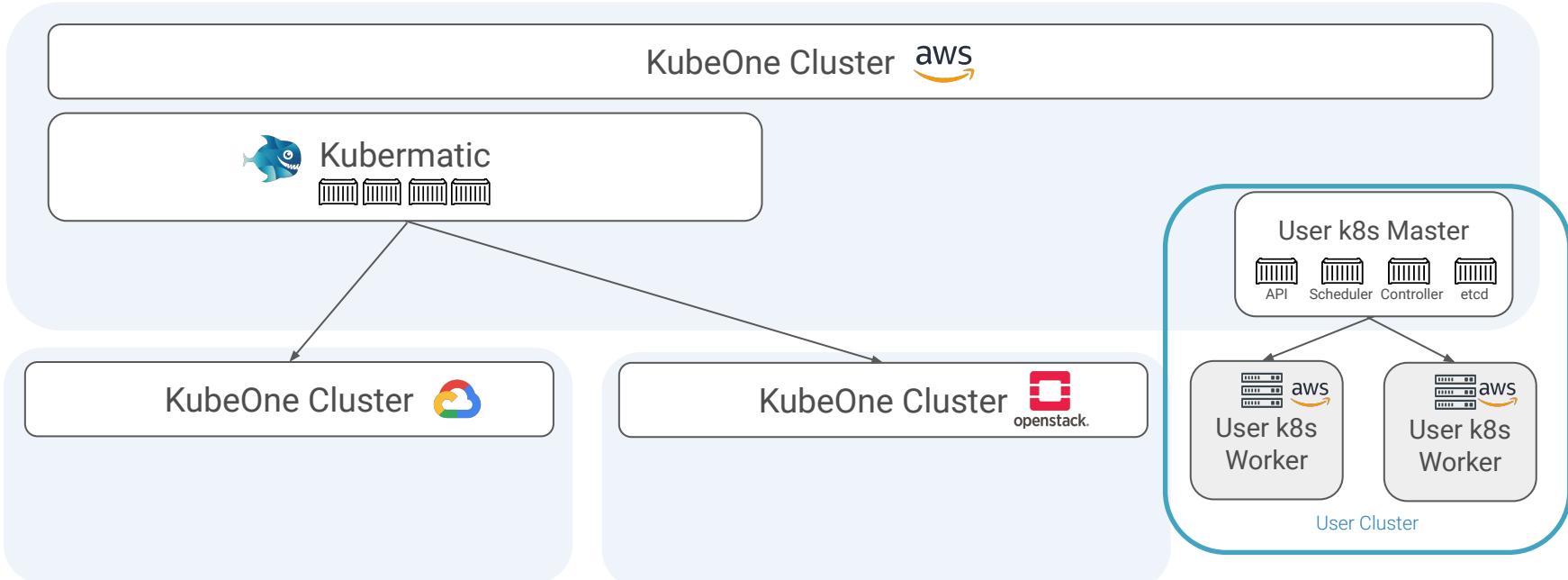


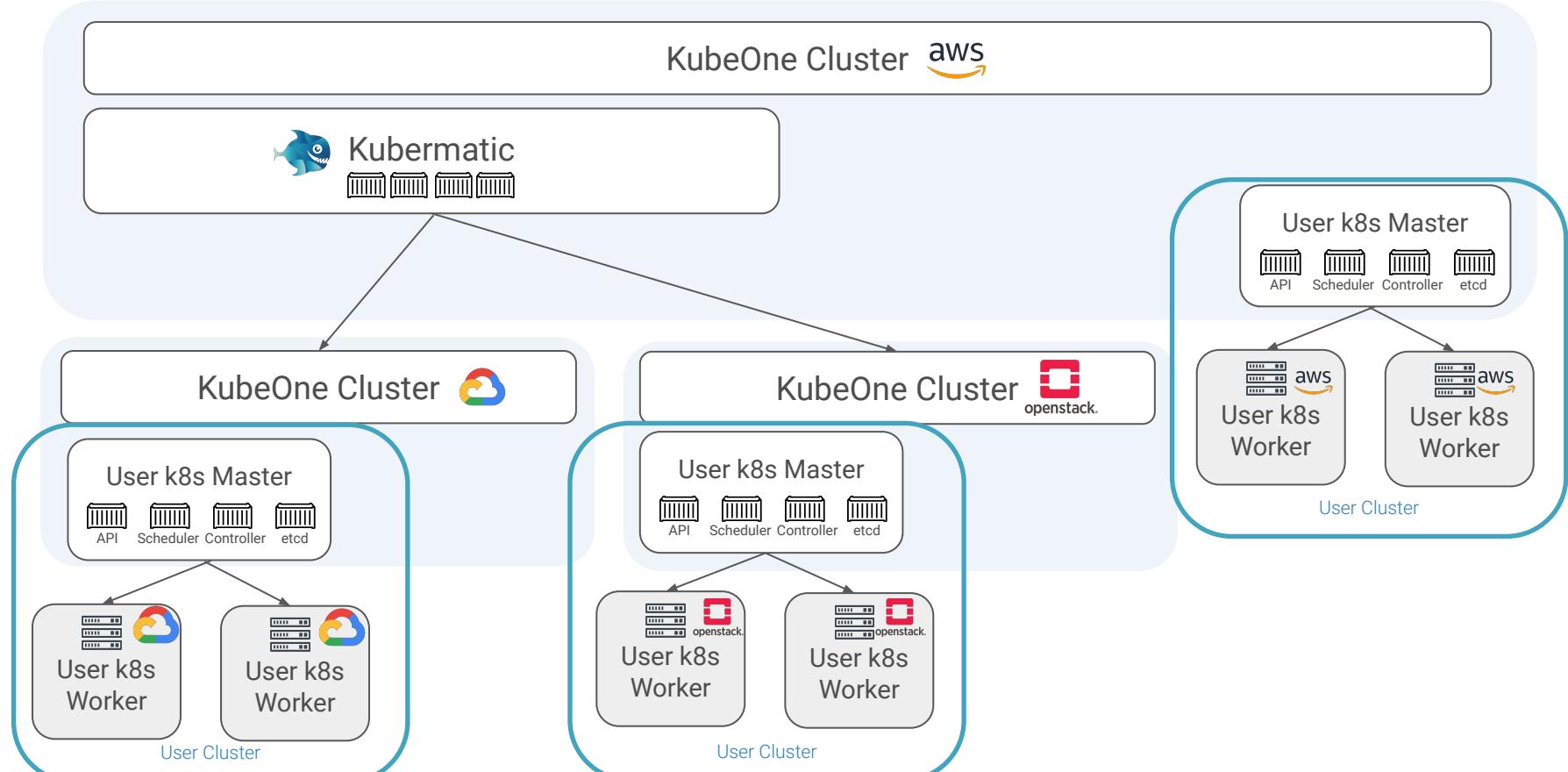
Running on Multi-Cloud & On-Prem



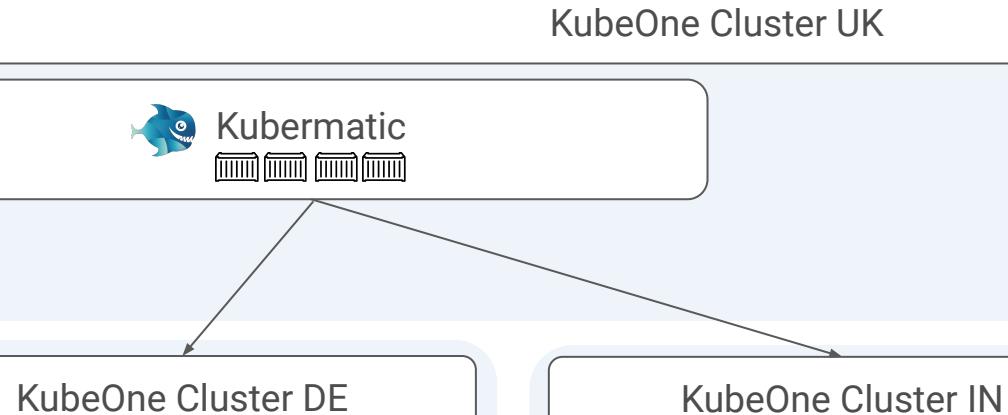


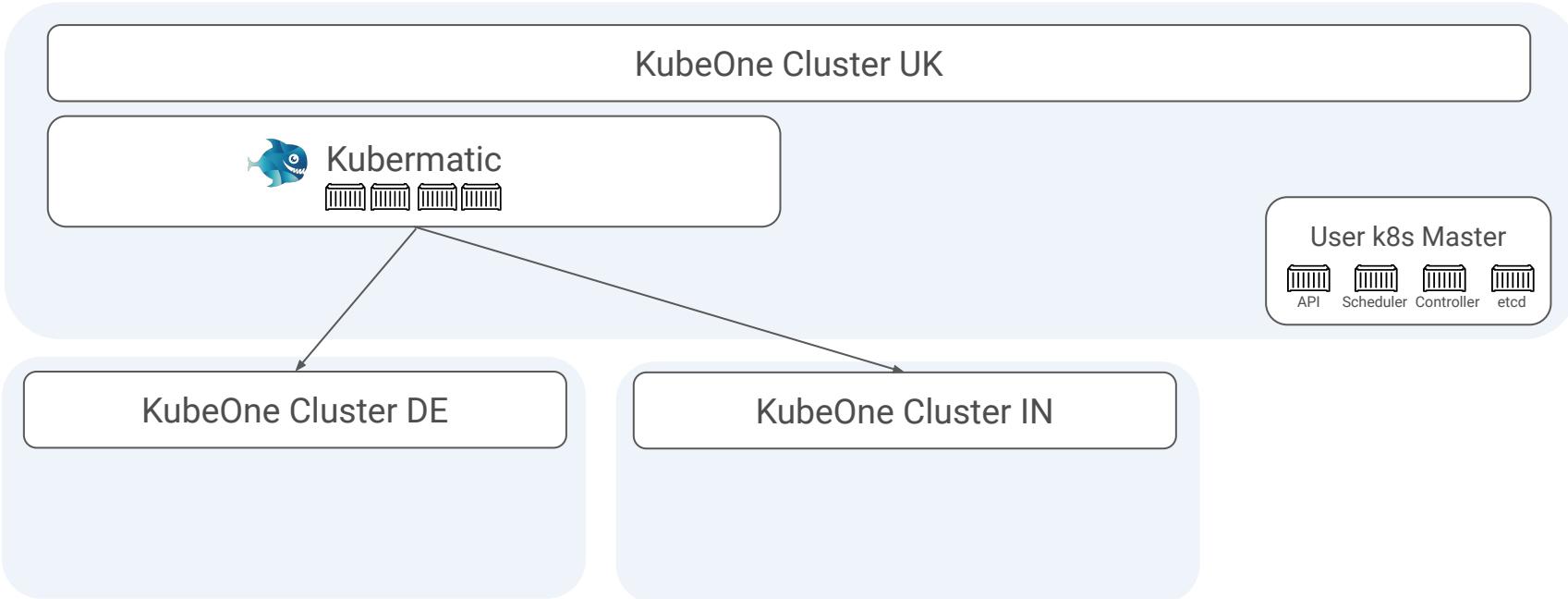


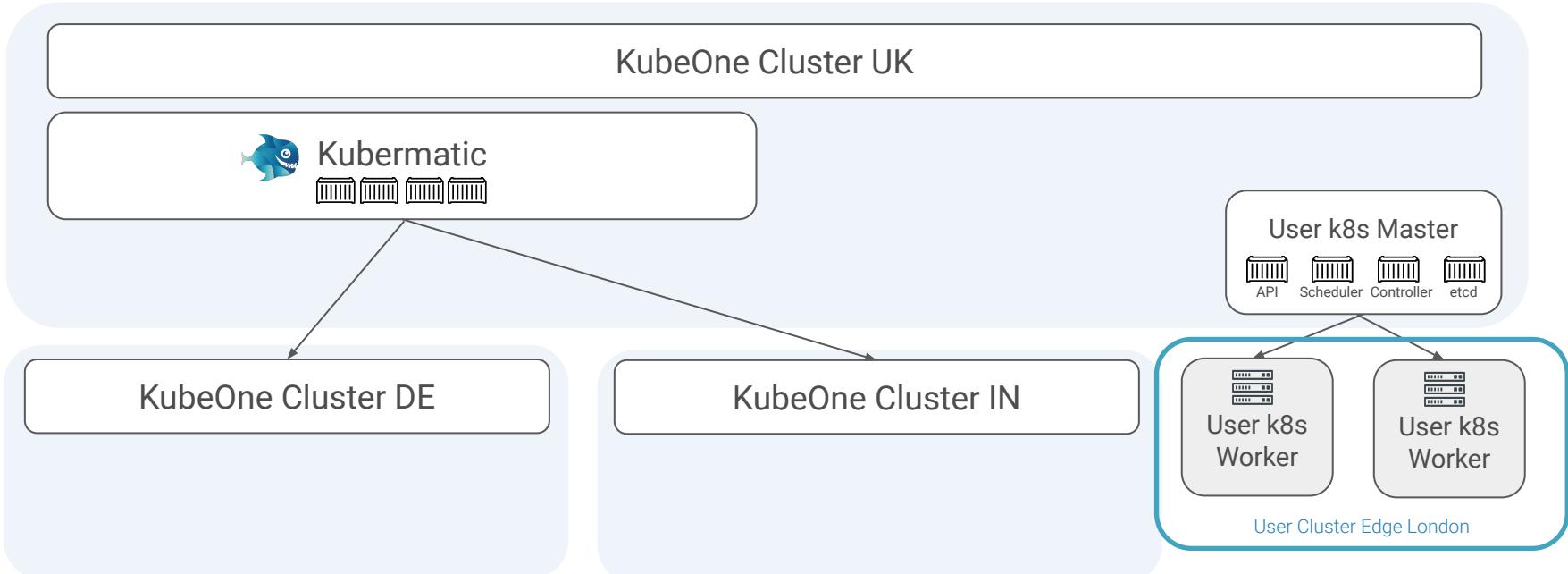


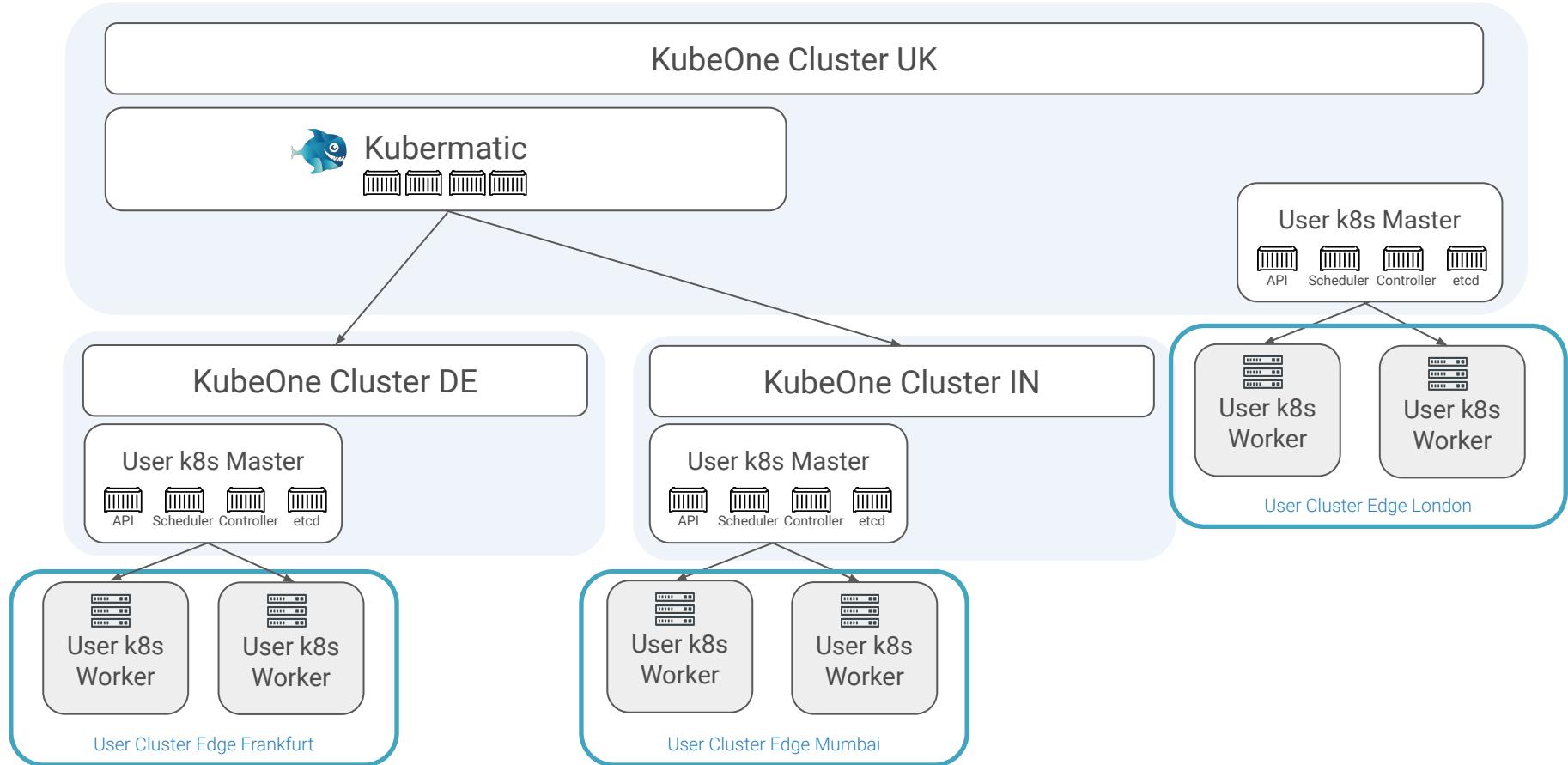


Built for Edge

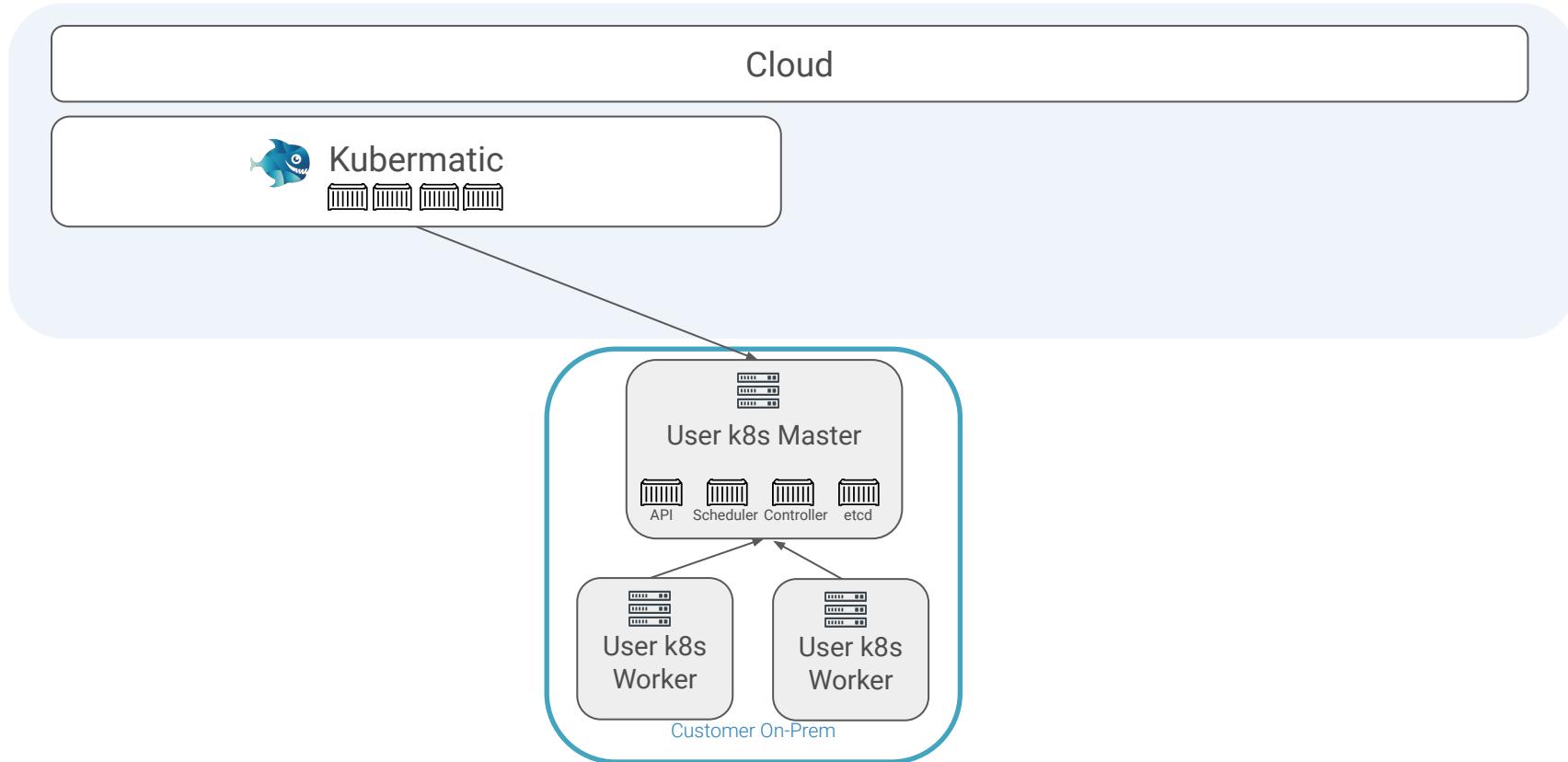






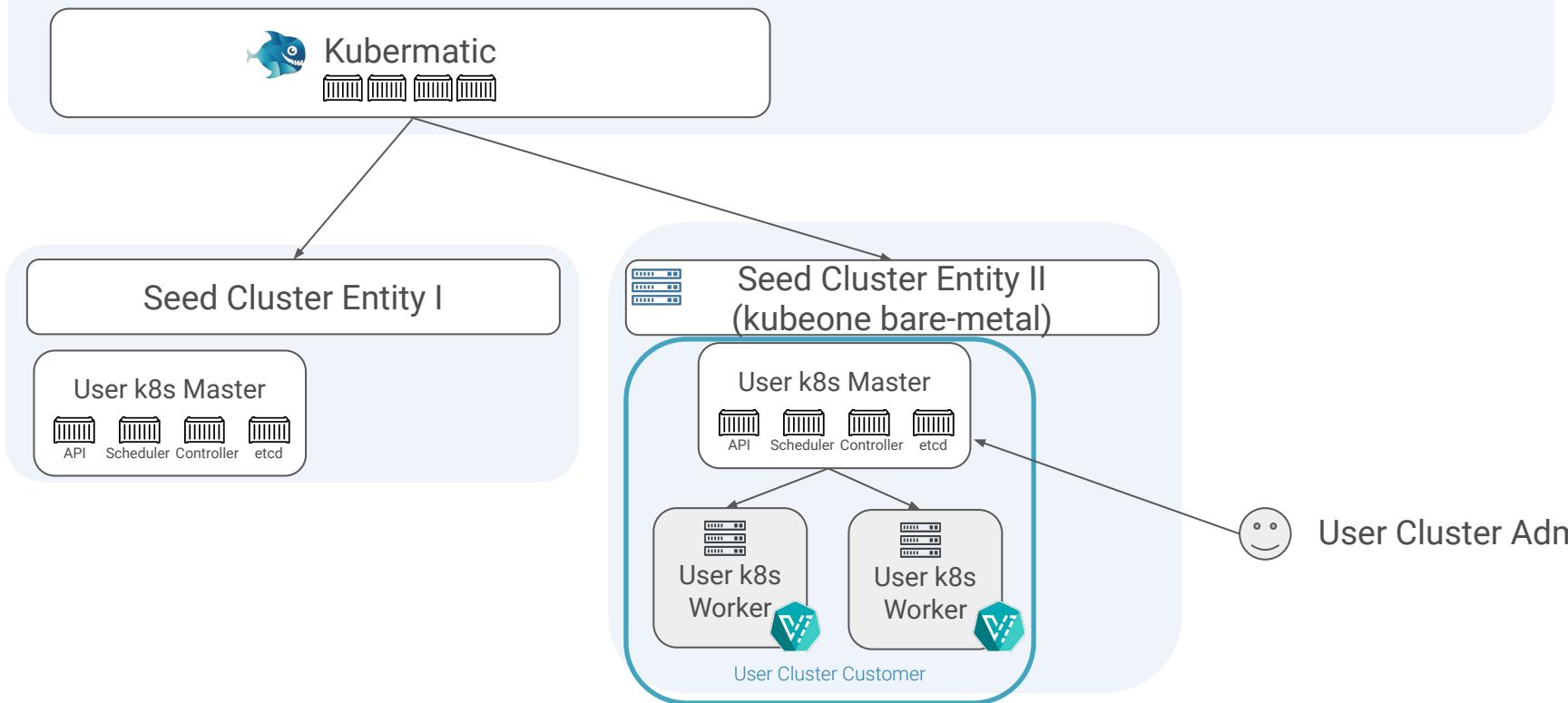


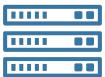
User Master and User Worker On-Prem



Kubermatic Virtualization powered by KubeVirt

Master Cluster Setup





Master Cluster

KubeOne provisioned bare metal nodes
(3 master untaint, n worker nodes)



Kubermatic

CSI Storage



User Cluster Admin

User k8s Master



User k8s Worker



Namespaced k8s cp + kubevirt machines

User k8s Master



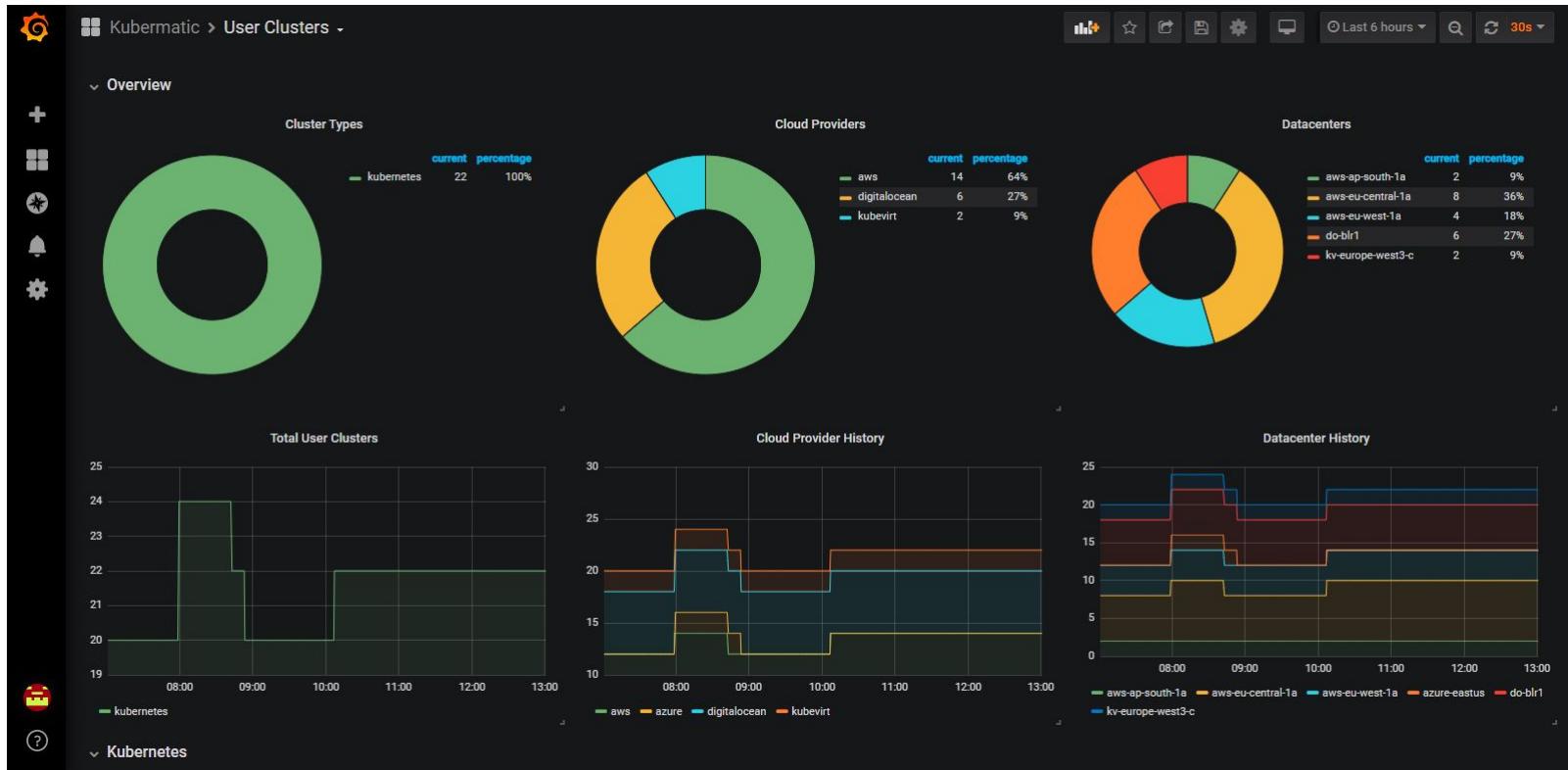
User k8s Worker



Namespaced k8s cp + kubevirt machines

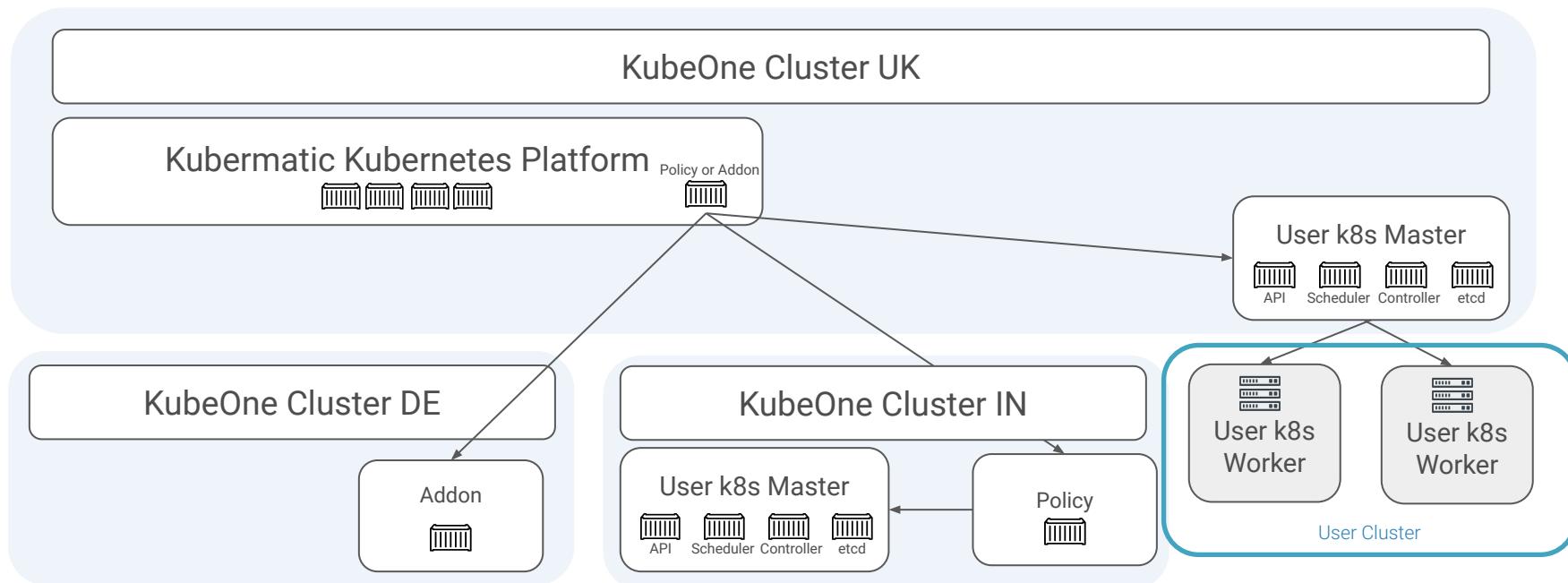
Monitoring & Logging

Infrastructure Monitoring and Logging

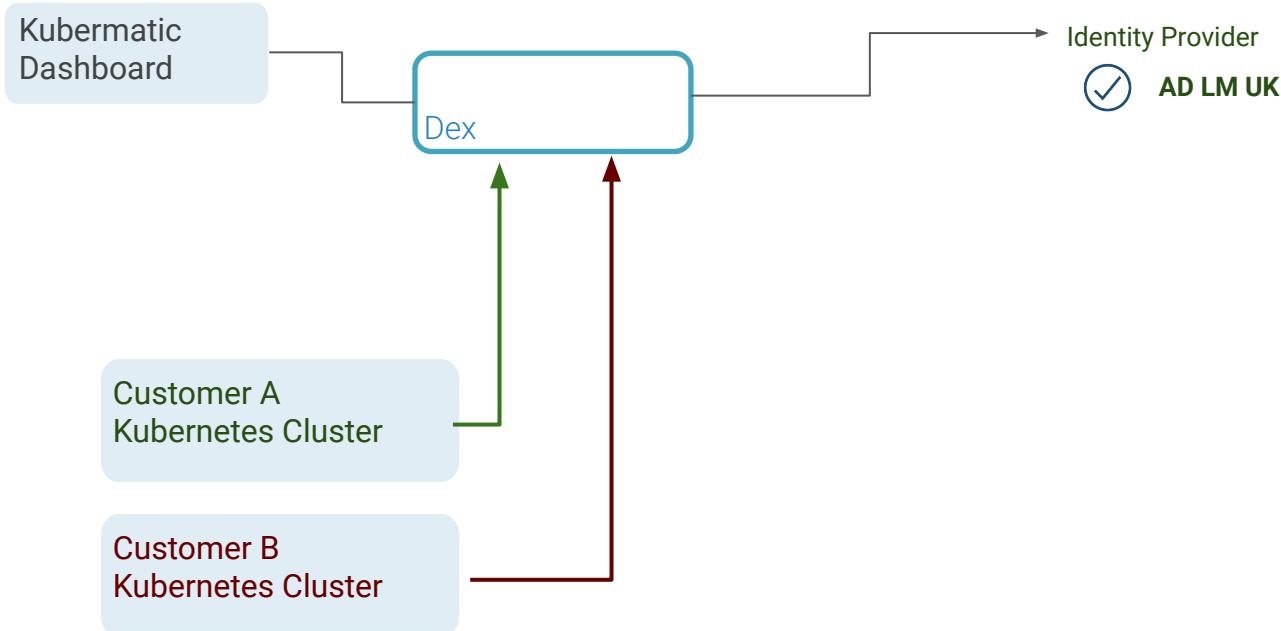


Platform Controls

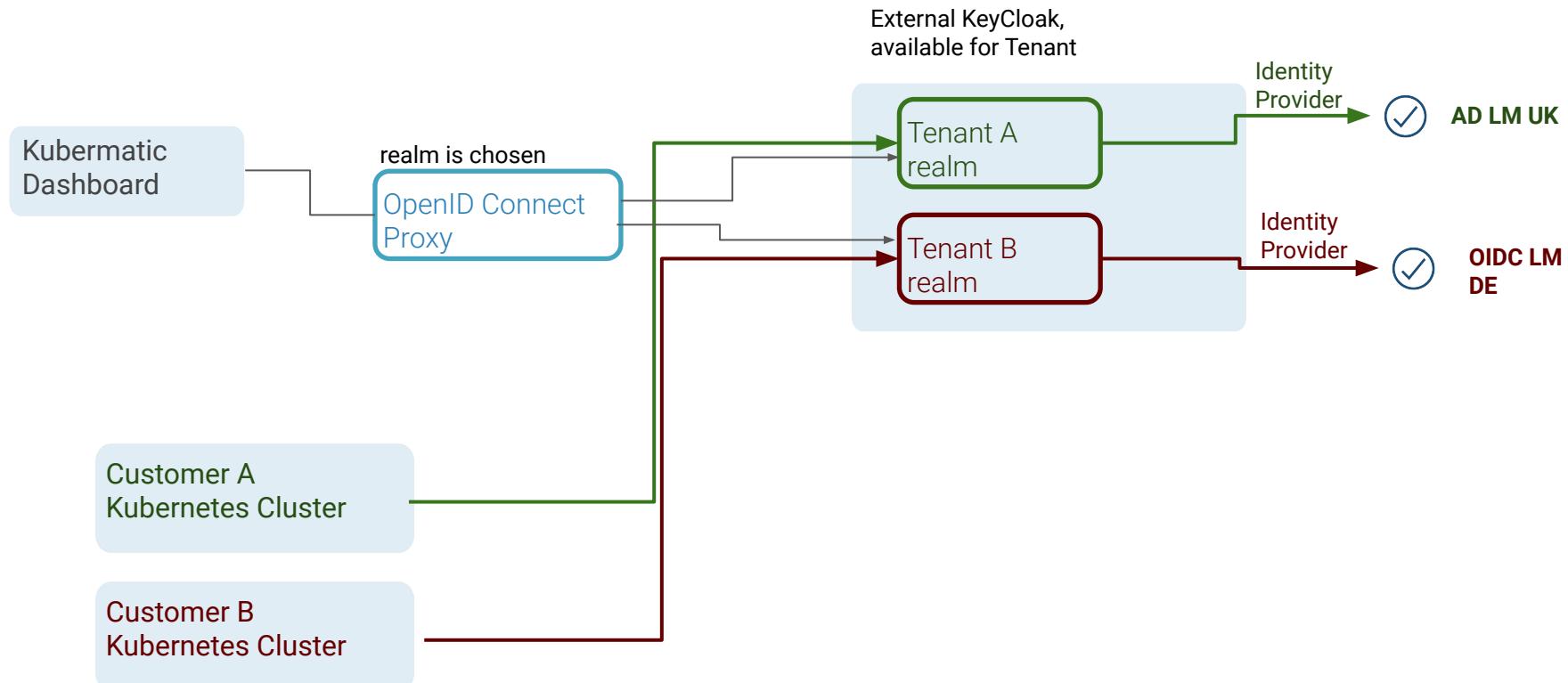
Policy and Addons for Cluster Blueprints



Identity Access Management for Multi Tenancy



Identity Access Management for Multi Tenancy



Security

- Provide Container Firewall with our Partner NeuVector
- Open Platform to support Kubernetes conformant solutions



Multi-Vector Container Firewall



Container Registry

- Kuberma^{tic} integration with Harbor
- Integration with JFrog Artifactory
- Any container registry can be used with Kuberma^{tic}



HARBOR

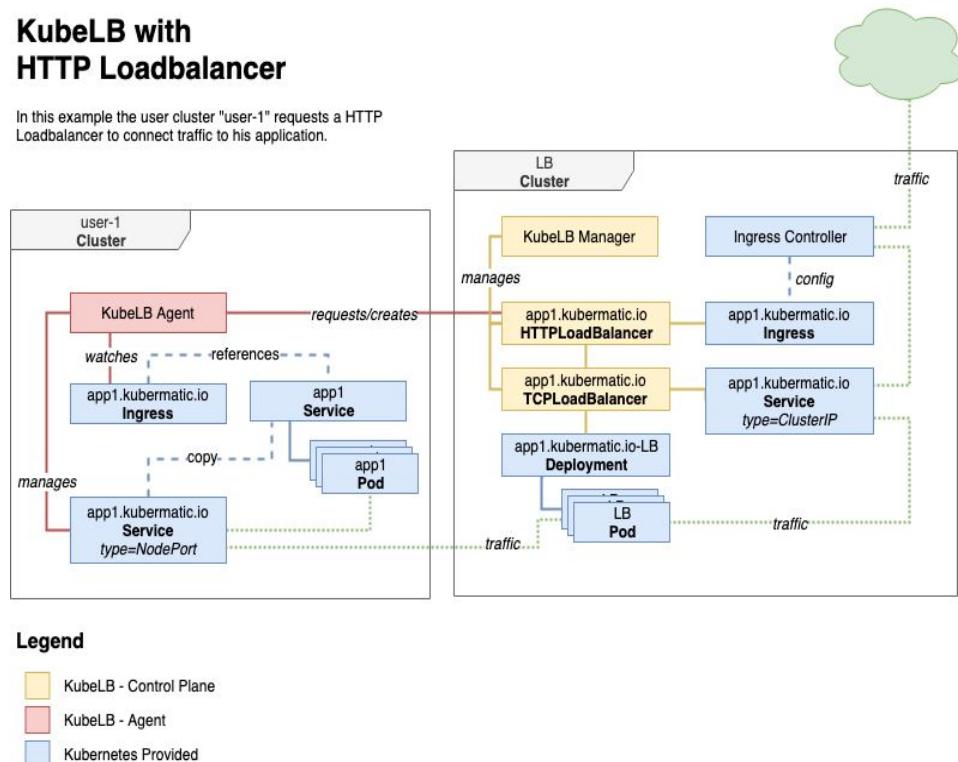


Ingress/Routing

- KubeLB
- Nginx
- Cloud Provider Integration

KubeLB with HTTP Loadbalancer

In this example the user cluster "user-1" requests a HTTP Loadbalancer to connect traffic to his application.



CNFs & VNFs on one Kuberma^{tic} Kubernetes Platform

Kuberma~~tic~~ enables VNFs & CNFs on one platform

- One Operational Model for Containers (CNF) and VMs (VNF)
- Supports legacy, brownfield, and greenfield mixed deployments
- Runs CNF workloads in Containers
- Allows legacy or specialized VNF workloads in Virtual Machines
- Connects VNFs+CNFs within the Kubernetes network
- Provides Network Consistency for VNFs and CNFs

CNFs on Kuberma~~tic~~ Kubernetes Platform

- Orchestration from Kuberma~~tic~~:
 - does not limit Kubernetes networking options
 - supports CNI network plugins
 - supports Multus use for dedicated (and multiple) interfaces per Container
- A Kuberma~~tic~~ CNF:
 - works with Kubernetes Pod+Service networks
 - employs an independent overlay network (K8s networks as underlay)
 - supports integration of Network Service Mesh (NSM)
 - supports integration of Istio



VNFs on Kuberma^{tic} Kubernetes Platform

- Technically: a CNF with a hypervisor layer
- Dedicated kernel
- Dedicated set of network namespaces (> vrf)
- Supports integration of Network Service Mesh (NSM)
- Supports integration of Istio



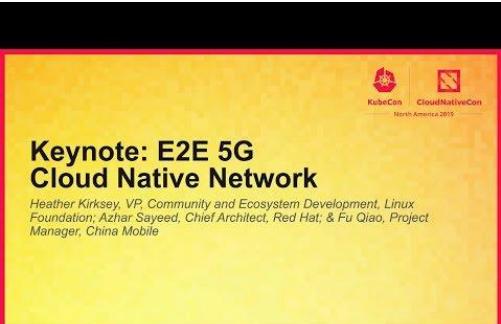
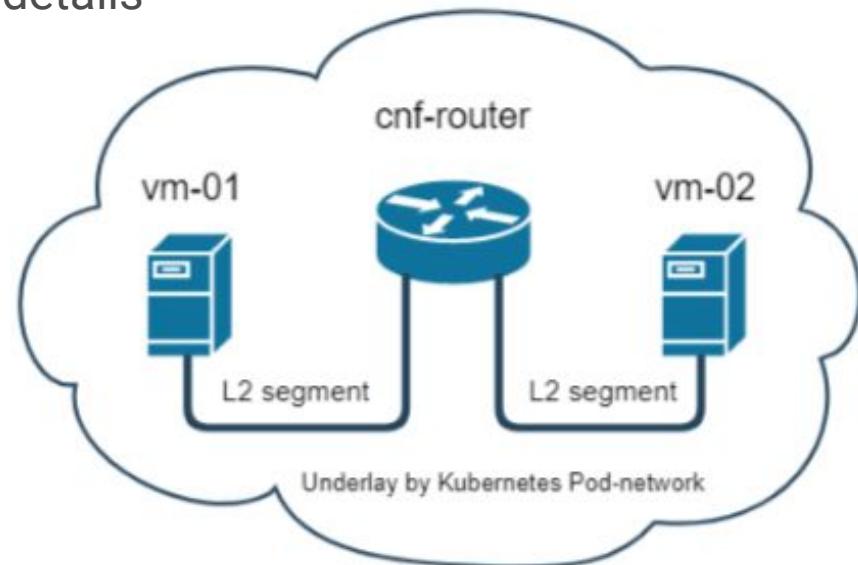
KubeVirt



katacontainers

Hybrid (CNF+VNF) Demo

- Services steer the underlay traffic
- Overlay has full NHRP (ARP as next hop resolution protocol)
- Independent of underlay implementation details
- KubeVirt used for VNF
- Payload: simple ICMP
- Independent overlay network (VXlan)



<https://youtu.be/lL4nxbmUIX8>

Kubermatic Operations Model

Flexible Operations Model

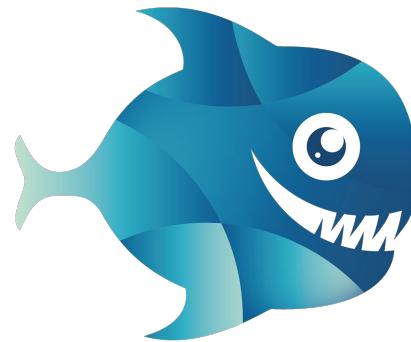
Fully self-managed

IaaS-hosted Kubernetes

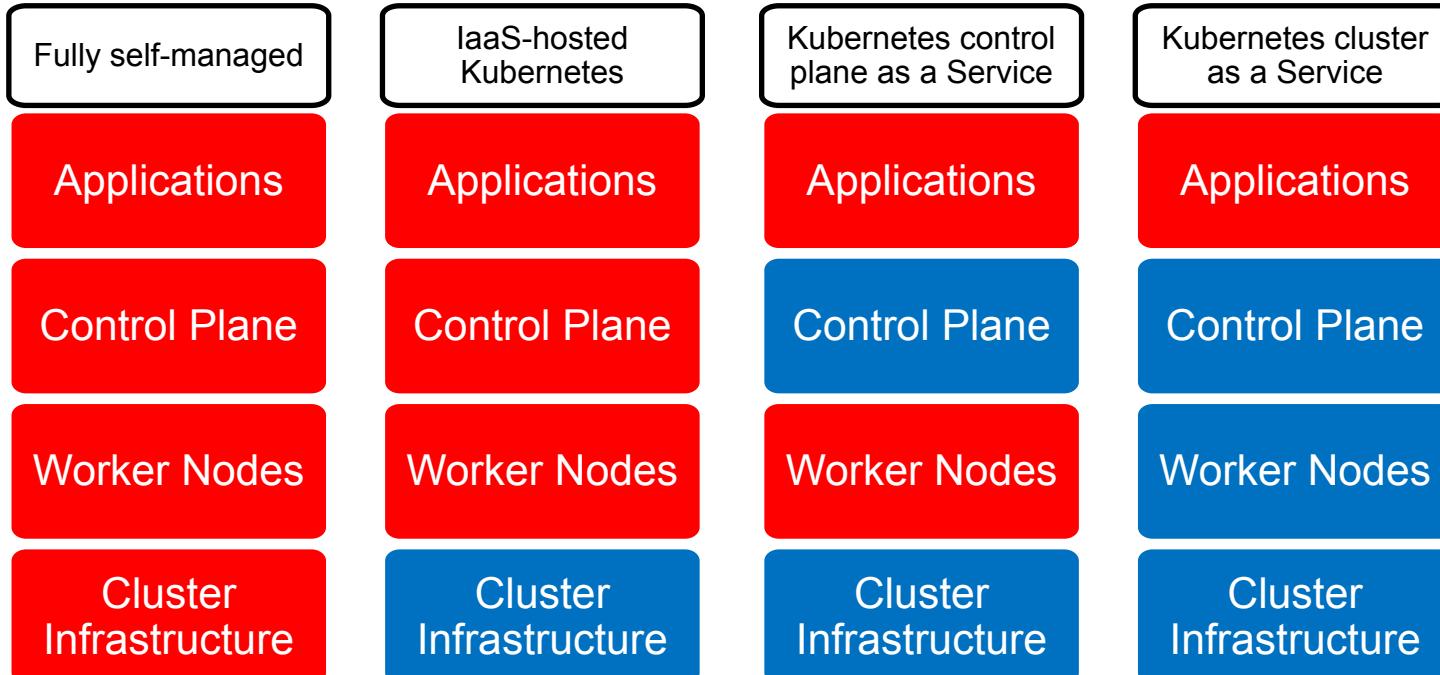
Hosted Service Provider

Control plane as a Service

Kubernetes cluster as a Service



Kuberma^{tic}



Kuberma~~t~~tic

Kuberma~~t~~tic

Kuberma~~t~~tic

Kubernetes

Kubernetic Enterprise Suite

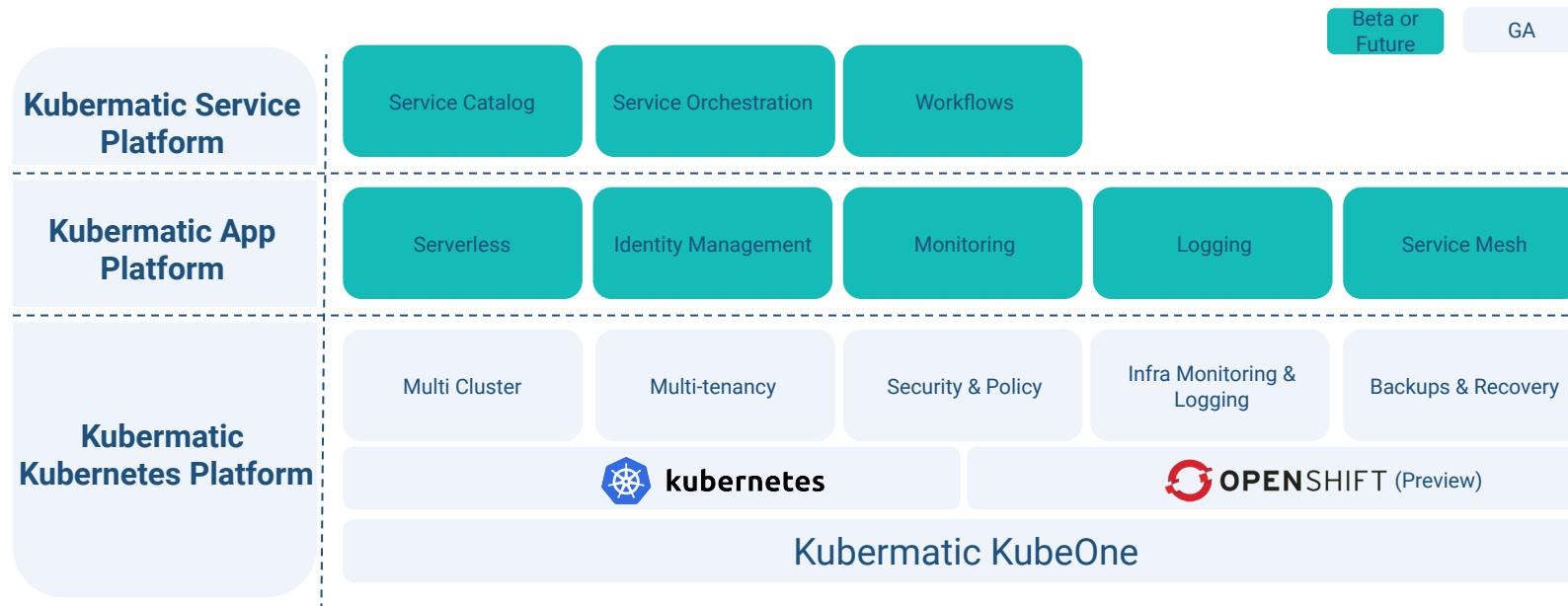
Roadmap

Roadmap 2020

The items in the roadmap are subject to change or delay, and the continued development or release of a feature on the roadmap is at the sole discretion of Kuberma^{tic}.

Kuberma^tic Enterprise Suite

Automated Platform consistency from Cloud to Core to Edge



Thank you!

Sales @ kubermatic.com